*i*DR Long Bone

USER MANUAL

iCRco

Digital Imaging Made Simple.™

Foreword

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Any one of the following ***i***CR products will be referred to as the "CR unit" throughout this document: ***i***CR 1000®, ***i***CR 1000 Dual®, ***i***CR 2600®, ***i***CR 2600 Dual®, ***i***CR 2600SF®, ***i***CR 3600®, ***i***CR Vet®, ***i***CR Vet Dual®, ***i***CR Mobile®, ***i***CR 1-D®, ***i***CR Chiro®, ***i***CR Chiro Dual® ***i***CR VERTX® Any one of the following ***i***CR products will be referred to as "***i***CR dual unit" throughout this document: ***i***CR 1000 Dual®, ***i***CR 2600 Dual®, ***i***CR Vet Dual®, ***i***CR Chiro Dual® Any one of the following ***i***CR products will be referred to as "***i***CR desktop unit" throughout this document: ***i***CR VERTX®. The ***i***DR®will be referred to as the "DR unit" throughout this document.

Contact Information

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*i*DR-L Information

Please Enter the details of the *i*DR-L system here:

Serial Number: _____

Date Purchased: _____

Interface Type: USB 2.0

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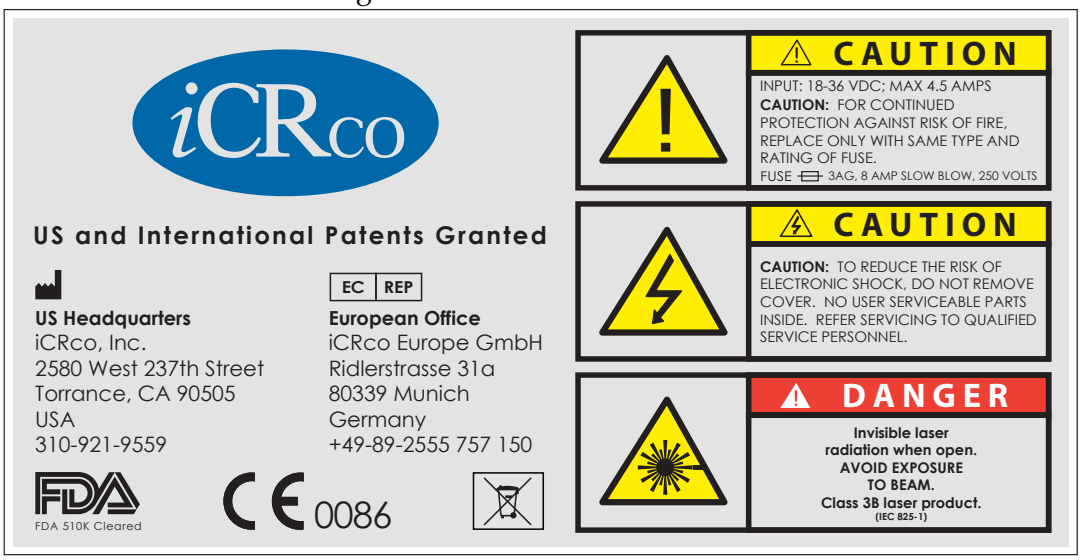
Safety Information

Read and understand the installation and operating instructions before applying power to the *i*DR-L.

Figure 1: *i*DR-L DC Model Label



Conventions

⚠ DANGER A DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

⚠ WARNING A WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION A CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Note A NOTE indicates important information that helps you make better use of your *i*DR-L and Software.

Notice A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

Laser Safety

⚠ CAUTION This equipment employs a laser. Laser radiation may be present if the *i*DR-L is operated without the covers. Avoid the laser beam. Direct exposure to laser light must be avoided.

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The *i*DR-L incorporates a Red $\geq$ 80mw high-power solid-state laser diode. The *i*DR-L covers protect the service person from direct exposure to laser light. These covers will protect a user/service person only if they are properly installed. Covers must be removed and replaced by properly trained service personnel. Contact ***i***CRco if there are any issues with the covers being damaged or replacement covers are needed.

Electrical Hazards

⚠ WARNING This equipment is operated with hazardous voltages which can shock, burn, or cause death.

Notice The *i*DR-L must be connected to a uninterruptible power supply (UPS). Failure to use a (UPS) will void the warranty.

The equipment must be serviced by properly trained technicians certified by ***i***CRco, Inc. Do not connect the *i*DR-L with a damaged or sub-standard power cable. Do not use an extension cord with this device. The *i*DR-L should be properly grounded and power connections inspected to ensure safe operation. Use at least a 1300VA (780W) uninterruptible power supply (UPS) with this device, as it is sensitive to variations in power.

Malfunctioning Equipment

If any ***i***CRco product shows signs of malfunction, discontinue the use of the product immediately and contact Technical Support at 310-921-9559.

FCC Notification

This equipment generates, uses, and can radiate radio frequency energy, and if not installed properly, can cause interference with radio communications.

Mammography Use

The *i*DR-L is not intended for Mammographic use.

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Guidance and Manufacture's declaration – Electromagnetic Emissions & Immunity

Table 1: Electromagnetic Emissions

Guidance and manufactures' declaration – electromagnetic emissions		
The *i*DR-L is intended for use in the electromagnetic environment specified below. The customer or the user of the *i*DR-L should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The *i*DR-L uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The *i*DR-L is suitable for use in all establishments, including domestic and those directly to the public low voltage pwoer supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class B	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Table 2: Electromagnetic Immunity

Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±(2, 4, 6) kV Contact ±(2, 4, 8) kV air	±(2, 4, 6) kV Contact ±(2, 4, 8) kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1kV for input/output lines	±2 kV for power supply lines ±1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.

continued on next page...

Table 2 continued...

Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle. 40% U_T (60% dip in U_T) for 5 cycles. 70% U_T (30% dip in U_T) for 25 cycles. <5% U_T (>95% dip in U_T) for 5 sec.	<5% U_T (>95% dip in U_T) for 0.5 cycle. 40% U_T (60% dip in U_T) for 5 cycles. 70% U_T (30% dip in U_T) for 25 cycles. <5% U_T (>95% dip in U_T) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the *i*DR-L requires continued operation during power mains interruptions, it is recommended that the *i*DR-L be powered from an uninterruptible pwoer supply or a battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

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Table 2 continued...

Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3Vrms 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the *i*DR-L, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separations distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b]. Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflections from structures, objects and people.

continued on next page...

Table 2 continued...

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location where the *i*DR-L is used exceeds the applicable RF compliance levels above, the *i*DR-L should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the *i*DR-L.
[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

iCRco Warranty

iCRco , Inc. ("iCRco") values your business and always strives to provide high quality products and services. All iCRco products are provided with an initial warranty so the hardware and software are covered from the date of purchase. This limited warranty solely applies to new products manufactured by or for iCRco and originally purchased from iCRco or an authorized dealer of iCRco products for your own use. In addition, an extended warranty is available for most new and recently purchased iCRco products for an additional charge.

Hardware Limited Warranty

iCRco warrants its hardware products to be free of defects in materials and workmanship for a period of one (1) year from the date of original shipment from iCRco subject to the limitations set forth herein. If a product proves to be defective in material or workmanship during the warranty period, iCRco will, at its sole option, repair or replace the product with a similar product. Repaired and replacement products may be or include refurbished or remanufactured parts. Any replacement item assumes the remaining warranty period of the original product. iCRco provides no warranty for any third party hardware or software included with any product or later acquired.

Software Limited Warranty/Support

iCRco warrants that its QPC XSCAN32, Captera, and/or ClarityPACS software originally provided with any product will substantially conform to iCRco's specifications and that the media, not including hard drives, on which the software is furnished will be free from

defects in materials and workmanship under normal use for a period of one (1) year from the date of original shipment from iCRco . iCRco's sole obligation under this warranty is limited to making reasonable efforts to ensure such conformity and to supply the consumer with a corrected version of the software as soon as it is practical after the consumer has notified iCRco of any non conformity. iCRco does not warrant that the operation of any software will be uninterrupted, glitch or error free or that functions contained in the software will operate in the combinations which may be selected for use by the user or meet the user's requirements. This limited software warranty will be void if the software is modified without the written approval of iCRco or is used outside of the recommended parameters or equipment. iCRco does not provide any warranty or support for any other software.

iCRco agrees to provide one (1) year of telephonic and/or e-mail based support for QPC XSCAN32, Captera, and/or ClarityPACS software originally provided with any new iCRco product from the date of original shipment from iCRco . All software support shall be limited to making reasonable efforts to resolve iCRco software issues and shall be limited to iCRco's regular business hours. In addition, iCRco will provide revisions and upgrades to its software upon request (when available) during the first year after the software was originally shipped from the iCRco factory. The initial support period will include support via remote login software (GoToMeeting), only if the customer has access to the Internet from that PC and only if the customer agrees iCRco shall have no liability in connection with its support efforts. Remote login software allows iCRco technical support to remotely access the customer's PC via the Internet for the purposes of rendering technical support. Please note that this warranty, including software support, does not include computer hardware, third party software or operating system or network issues, which are outside the control of iCRco.

Warranty Product Technical Requirements

iCRco requires that all DR, CR, Scanner and/or products requiring PCs be fitted and installed with a 1500VA (1500W) uninterruptible power supply ("UPS"). iCRco recommends the APC 1000 specification UPS or equivalent. For warranty evaluation and service, iCRco requires the customer to provide an Internet connection (DSL or Dial-up) or the minimum of a phone line accessible by an extension cord to the product enabling iCRco technicians to perform remote diagnostics on installed equipment. In addition, each iCRco product must be installed, maintained and operated in accordance with the respective product manual. Failure to comply with these requirements will result in a voided warranty claim.

Requesting Warranty Service

For information on obtaining warranty service, call iCRco's customer support at (310)921-9559. In order to evaluate a warranty service request, iCRco requires the following information: the iCRco serial number of the product, a detailed description of the problem, customer name and contact information; product location and operating conditions; a copy

of the purchase documents, and sufficient information and authorization, including a liability release as to any loss of data (that should always be backed up), software or network injury, or downtime, allowing iCRco technicians remote access to the product. Product may not be returned to iCRco without first obtaining a Return Material Authorization ("RMA") number from iCRco . Prior to providing an RMA, iCRco may require remote access to the product. If iCRco determines that the product may be defective, is under warranty and necessitates a return to iCRco for service, an RMA number and instructions for return of the product will be given. iCRco is not responsible for any unauthorized returned product, i.e. one for which an RMA number has not been issued by iCRco .

Warranty service requires all authorized returns be shipped to the iCRco factory prepaid and insured. All such authorized returns are the customer's responsibility. For products sold and located within the United States, iCRco will pay for return shipping.

Products being returned are only to be shipped in iCRco approved shipping containers. The original box and packaging materials are approved and should be kept for moving and/or shipping the product. Approved packaging my also be purchased from iCRco for an additional charge. iCRco shall have no liability nor responsibility for warranty service to any product that is not shipped in an iCRco approved shipping container or that is damaged from incorrect packaging or damaged during shipping.

Additional Warranty Limitations and Extent of Warranty

This warranty does not apply if the product has been damaged by accident, misuse or abuse. In addition, warranty service does not include the repair of failures or defects caused by: unauthorized attachments to any iCRco product, unsuitable physical or operating environment, maintenance or repair by anyone other than iCRco or the iCRco authorized dealer that sold the product, operation of a product beyond its duty cycle, use of the product outside of its specifications, the use of supplies, parts, materials, software, or interfaces not furnished, authorized or recommended by iCRco . If the product, including any software has been opened, tampered with, modified or altered in any way without written authorization by iCRco , the warranty will no longer apply.

This warranty applies only to products manufactured by, or for, iCRco , and that can be identified by an "iCRco" serial number as originally affixed to the product. Any modification to the iCRco serial number tag or its attachment to the product shall immediately void the warranty.

This warranty is non-transferable and subsequent owners must contact iCRco to establish if the equipment is eligible for an extended warranty.

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The exclusive remedy for any defective product is limited to the repair or replacement of the defective product. iCRco shall have a reasonable time after determining that a defective product exists to repair or replace a defective product. iCRco's entire liability for any product is limited to the actual purchase price for the product. This limitation applies even if iCRco cannot or does not repair or replace any defective product.

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Revision History

Revision	Author	Date	Notes
A	MS	2010-01-29	Initial Release
B	MS	2010-07-27	Updated safety and wall mount instructions

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1. Introduction

1.1 Overview

The *i*DR-L (***i***CRco's patented integrated Digital Radiography system) is a sealed Digital Radiography system that uses a high resolution phosphor to capture high quality images. The photostimulated luminescence is collected, detected, sampled, and digitized. The image data is then digitally processed according to exam and user-specified parameters and displayed on a monitor to confirm patient positioning. The image can optionally be printed by a hard copy device (such as laser printer, or dry printer), or transmitted to a workstation, optical disk file, or other destination. The device performs lossless compression of the image data for efficient transmission.

The Image Reader is cassetteless because the Image Plate is built into the *i*DR-L. The imaging plate is exposed via conventional X-ray devices. The X-ray irradiated IP is stationary and the scan head moves from the exposure position to the reading position, and images are read. After reading, the IP is erased, and the scan head is moved to the exposure position again. The *i*DR-L collects 16 Bit data that is converted to a DICOM 3.0 image and can be stored, viewed, and manipulated.

This document contains a basic operational overview of the *i*DR-L, including the driving software applications, cassette cleaning & handling, and hardware installation. A general description of the system's functionality and user interfaces are included. This document is intended for end users who need to understand the basic operation of the *i*DR-L.

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2. Pre-Installation

2.1 Voltage Requirements

iCRco employs CE certified medical grade power supplies. See Section 2.3 on page 2 for UPS requirements. The *i*DR-L is supplied with a DC power supply that allows the unit to work between 18 to 36 VDC, 4.5 Amps (maximum), and 450 Watts. ***i***CRco provides a medical power converter. Do **not** substitute or switch the power converter. Substituting or switching the power converter will void the warranty. Contact ***i***CRco Tech Support to obtain a replacement power converter.

2.2 Environmental Requirements

The *i*DR-L should not be placed in a room with a film processor present. This will void the warranty. The humidity and temperature limits are 20 to 80% non-condensing, and 15°F to 95°F (15°C to 35°C) operating, respectively. The room should have good ventilation. Another factor to consider prior to installing the *i*DR-L is dust and particulates in the environment. The *i*DR-L is designed to be resistant to dust and particulates that may be present at the installation site.

Installation of the *i*DR-L near high magnetic fields may cause the CR unit to malfunction. The *i*DR-L should not be placed in a room with an MRI, CT or any other equipment that produces high magnetic fields.

The room should have good ventilation.

Note It is recommended that the unit be installed and operated in a clean, dry environment.

2.3 Connectivity and Power Supply

The room needs to have wall power and the *i*DR-L should not be used with an extension cord. Use at least a 1300VA (780W) uninterruptible power supply (UPS) between the wall power and the *i*DR-L. A network connection is required for technical support. Alternatively, the user must have a phone/fax line that can be connected to the PC as a minimum to comply with ***i***CRco warranty terms.

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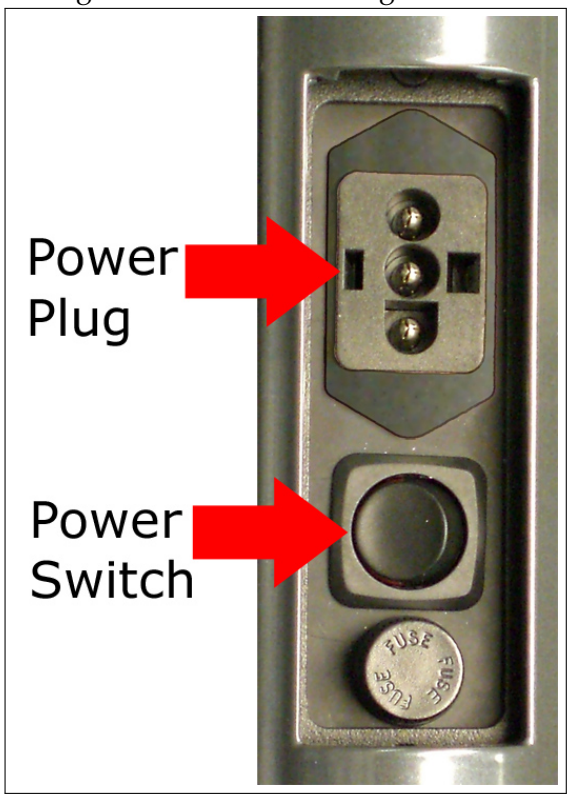
2.4 Power Switch Location

The power switch for the *i*DR-L is located on the left hand side of the unit, near the power plug.

Figure 2.1: DC Power Plug & Switch



2.5 Power & Scan Lights

The power and scan lights are located on the lower right-hand side of the *i*DR-L. When the unit is powered on, the green light is illuminated. While the unit is scanning the yellow light blinks.

2.6 Physical requirements

The *i*DR-L requires a stable operating environment. ***i***CRco requires that the *i*DR-L be used in the supplied Wall mount or Cart. Failure to use the *i*DR-L in the supplied Wall mount or Cart will void the warranty.

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2.7 Systems Specifications

The ***i***DR has a 14x51 inch active capture area.

Pixels per Line Resolution

3500 (High Resolution) over 14 inches (356 mm) 2048 (Normal Resolution) over 14 inches (356 mm).

Scan Rate

Scan Rate 60 lines/second

Grey Scale Resolution

16 bits (65,535 shades of gray)

Interface

USB 2.0

Dimensions

19.5W x 72.25H x 6.32D inches

Power Requirements

DC Input:

Volts:	18-36 VDC
Amps:	4.5 Amps
Max Watts:	450 Watts

Temperature Conditions

32 to 105°F	(0 to 40°C) - operating
-1 to 150°F	(-1 to 65°C) - non-operating

Humidity

15 to 95% non-condensing

Vibration/Acceleration

3-4G Max (in shipping)

Altitude

0 to 9,500 ft. - operating

Weight

100 lbs

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3. Hardware Installation

3.1 Unpacking Instructions

1. Open the box from the top.
2. Remove any small accessories loaded into the top of the box.
3. With at least two (2) people, lift the *i*DR-L out of the box.
   ⚠ CAUTION Always practice proper heavy lifting procedures. Failure to practice proper lifting procedures may result in injury or damage to the unit.
4. Store the box and any foam inserts somewhere safe & dry, so that if the *i*DR-L needs to be shipped again, there are packing materials available.

3.2 Installing Power & USB 2.0 Cables with Power Cowling

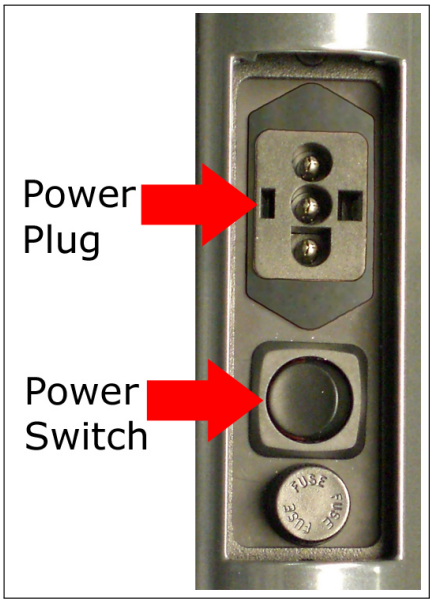

Figure 3.1: DC Power Plug & Switch

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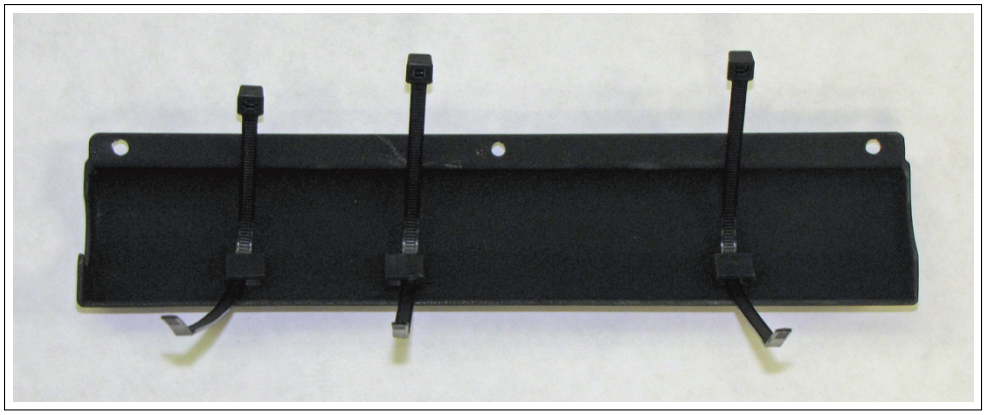
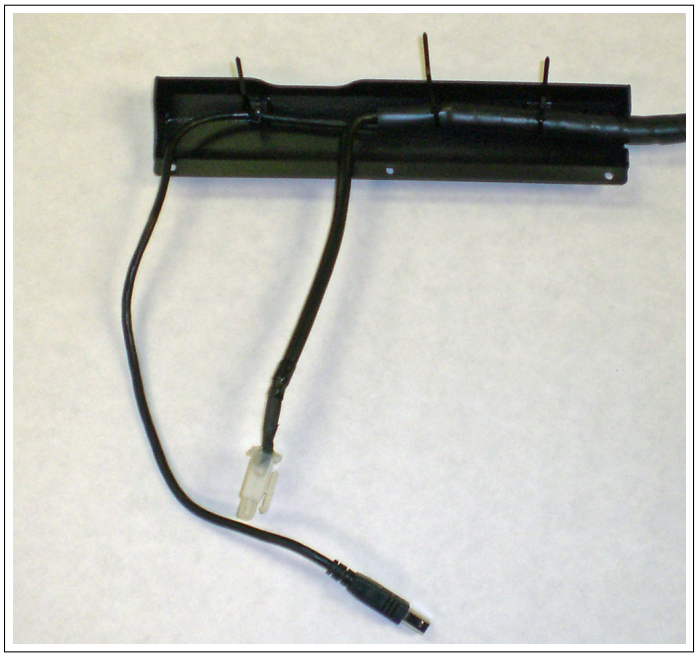
Note The following instructions are for both the AC and DC ***i***DR units, though only the AC is shown below.

1. Thread three (3) zip ties through the metal eyelets.



2. Lay the Power and USB 2.0 cord bundle in the Power Cowling, ensuring that the thickest part of the cord bundle is positioned at the bottom of the power cowling.



3. Pull the zip ties as tight as possible around the cord bundle. Gently pull on the cord bundle to ensure it is tightened enough in the Power Cowling. Clip off any excess zip tie.

4. Remove the external fuse from its housing, then pass the USB 2.0 cable under the safety catch and plug in the USB 2.0 cord.

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5. Plug the power cord for the *i*DR-L into the power switch unit.
6. Fasten the Power Cowling to the Shoulder Extrusion using three (3) 6-32 x $\frac{3}{8}$″ flathead screws.

7. Plug the USB 2.0 cord into the Acquisition computer.
8. Ensure the UPS battery is connected to its terminal.
9. Plug the other end of the power cord into the UPS.
10. Plug the UPS power cord into the wall.

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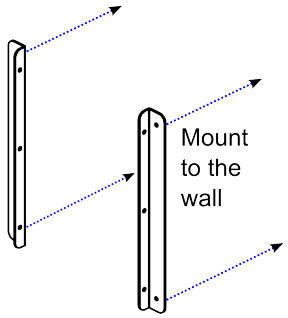
3.3 Wall Mounting

Notice Wall mounting plates must be installed by a licensed contractor.

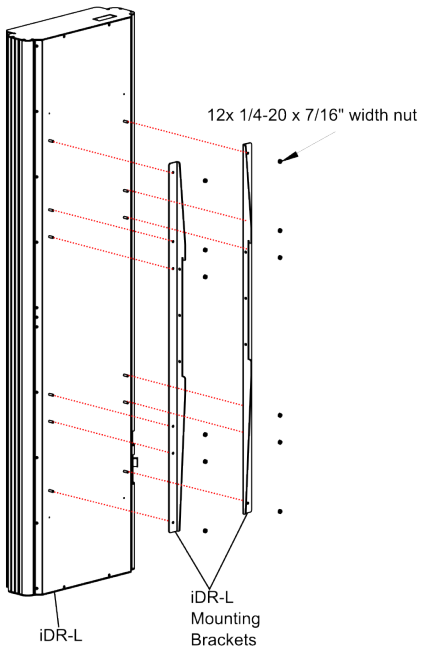
1. Attach the small wall mounting plate against the wall at the desired height. Allow the contractor to determine the proper screws to fasten the small wall mounting plate to the wall. The *i*DR-L with all accessories attached weights approximately 100 pounds.

Figure 3.2: Fastening the small wall mount plates to the wall



2. Fasten the *i*DR-L to the large wall mounting bracket using twelve (12) 1/4-20 x 7/16″ width nuts.

Figure 3.3: Fastening the *i*DR-L to its wall mounting hardware



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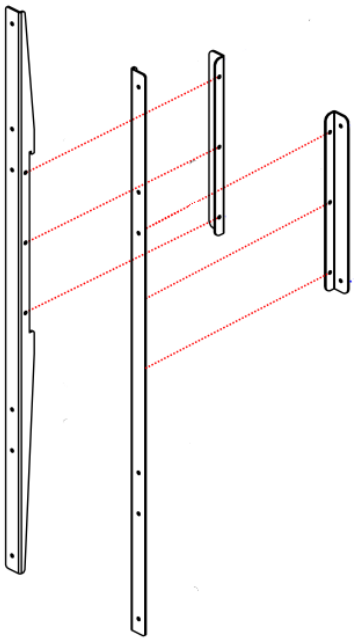
⚠ CAUTION Heavy Lift. Use at least two people. Improper lifting may cause injury.

3. With at least two people, fasten the large wall mounting bracket to the small wall mounting bracket using four (4) 1/4″-20 bolts and nuts.

Figure 3.4: Fastening the large wall mounting plate to the small wall mount plate.



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4. Software Installation

4.1 PC Specifications

The minimum requirements for the Acquisition computer are as follows:

Processor:	Pentium D
RAM:	2 GB or more
OS:	Windows XP
HDD:	250 GB or more

4.2 USB Driver Installation

Installation of USB drivers are automatic with the installation of the ***i***CRco software (i.e., QPC XSCAN32).

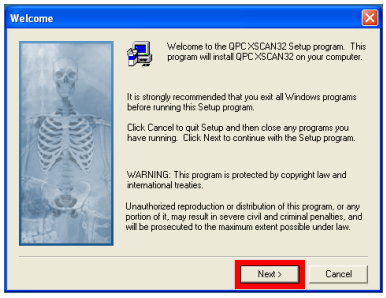
4.3 Installing QPC XSCAN32

QPC XSCAN32 software comes bundled with the *i*DR-L. This software package will allow the user to interface with the *i*DR-L.

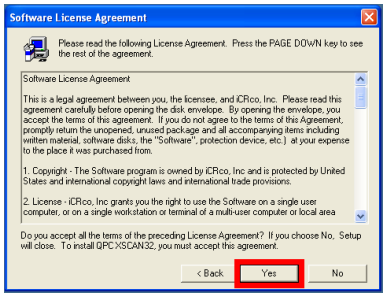
Note If you have QPC XSCAN32 already installed on your computer and it is running while you are trying to install the new version, an error will appear in the install process. Please close QPC XSCAN32 and reinstall the new version.

Notice The *i*DR-L requires QPC XSCAN32 build 848 or greater.

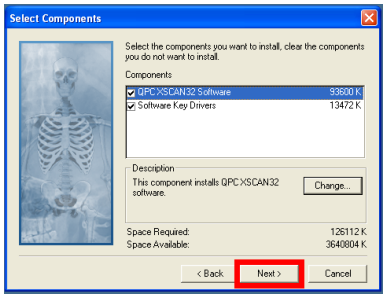
1. Insert the media containing the QPC XSCAN32 installer into the computer. Navigate to the *QPC XSCAN32* folder.
2. Launch the QPC XSCAN32 installer by double clicking **Setup.exe**.
3. Click **Next** at the welcome screen.


Welcome
Welcome to the QPC XSCAN32 Setup program. This program will install QPC XSCAN32 on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup program.
Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
Next >
Cancel

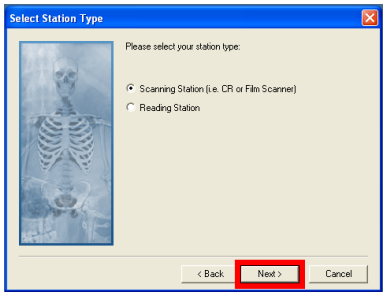
4. Click **Yes** to agree to the Software License Agreement.


Software License Agreement
Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.
Software License Agreement
This is a legal agreement between you, the licensee, and iCRco, Inc. Please read this agreement carefully before opening the disk envelope. By opening the envelope, you accept the terms of this agreement. If you do not agree to the terms of this Agreement, promptly return the unopened, unused package and all accompanying items including written material, software disks, the "Software", protection device, etc.) at your expense to the place it was purchased from.
1. Copyright - The Software program is owned by iCRco, Inc and is protected by United States and international copyright laws and international trade provisions.
2. License - iCRco, Inc grants you the right to use the Software on a single user computer, or on a single workstation or terminal of a multi-user computer or local area
Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install QPC XSCAN32, you must accept this agreement.
< Back
Yes
No

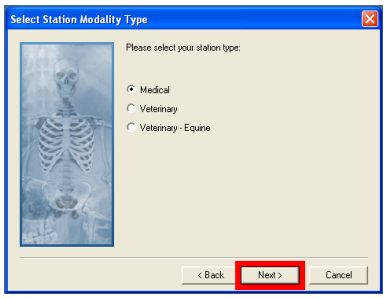
5. Make sure both *QPC XSCAN32 Software* and *Software Key Driver* boxes are checked, then click **Next**.



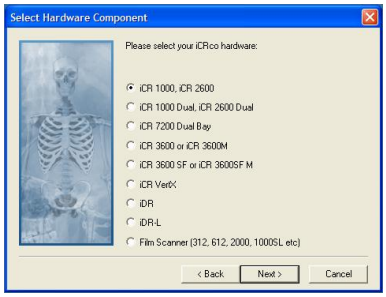
6. Select *Scanning Station* or *Reading Station* depend on the use, then click **Next** to continue.



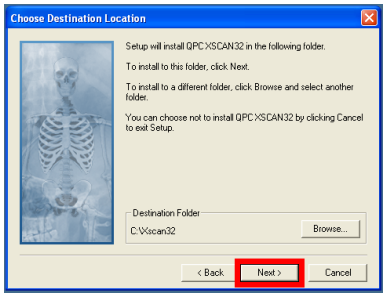
7. Select the appropriate modality, then click **Next** to continue.



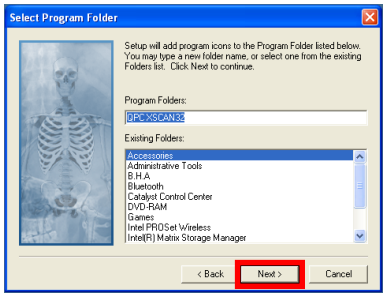
8. Select the appropriate hardware profile, then click **Next** to continue.



9. The Destination Folder should be set to *C:\Xscan32*, then click **Next** to continue.


Choose Destination Location
Setup will install QPC XSCAN32 in the following folder.
To install to this folder, click Next.
To install to a different folder, click Browse and select another folder.
You can choose not to install QPC XSCAN32 by clicking Cancel to exit Setup.
Destination Folder
C:\Xscan32
Browse...
< Back
Next >
Cancel

10. The Program Folder name should be set to *QPC XSCAN32*, then click **Next**.



11. QPC XSCAN32 will begin to install. Be patient while XSCAN32 installs.

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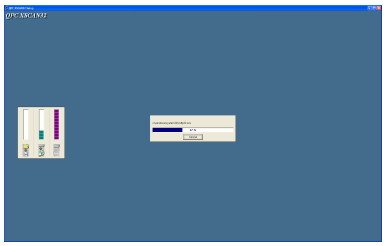
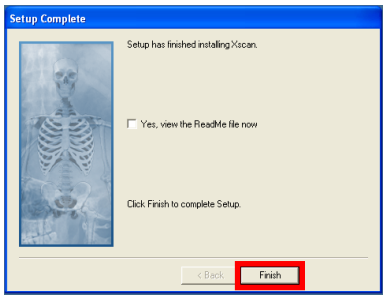


12. Click **Finish** to complete the installation of QPC XSCAN32. The installer will exit.



Note The Calibration Toolkit (The X-ray Calibration Toolkit is designed to test and maintain a consistent correlation between the x-ray source and *i*DR-L) is located at

`C:\XSCAN32\XRAYCALIBRATIONTOOLKIT.PDF`

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5. System Operation

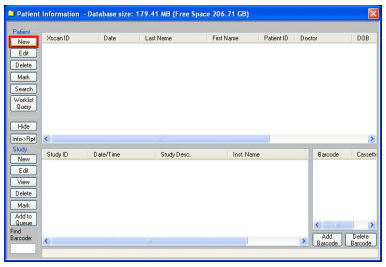
5.1 Power-Up

The power switch is located on the middle, left-hand side of the device. Ensure the UPS is powered on, then toggle the *i*DR-L's power switch to the **ON** position & press the **Reset** button in the scan interface.

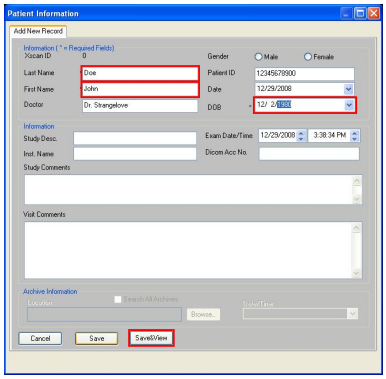
Note The *i*DR-L should be allowed to warm up for 5 minutes prior to use in order to stabilize the system.

5.2 Acquiring an Image

1. Open QPC XSCAN32.
2. Create or edit patient profile. To do this, click **New** or **Edit**, respectively.



3. If creating a new patient, enter the relevant patient info, or if editing a patient, change the information accordingly, then click **Save and View.**



4. Click on **Scan** to bring up the Quality Processing Center Scan dialog. (if it is a patient with no images the scan dialog will automatically appear).

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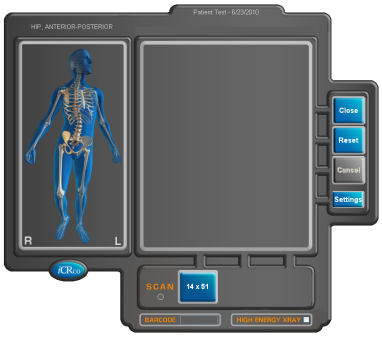
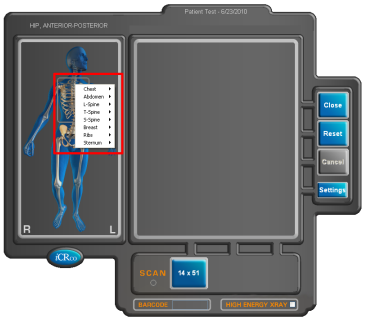
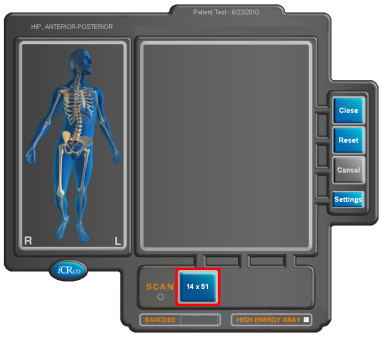
5. The *i*CR Quality Processing Center dialog will appear.



6. Select the anatomy by mousing over the skeleton on the left hand side of the Quality Processing Center dialog.

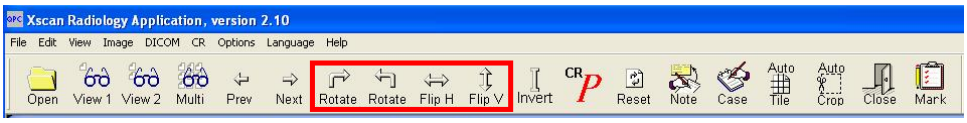


7. To begin scanning, select the scan size by clicking the correct button (i.e. 14x51 in, Region 1, Region 2, etc.).

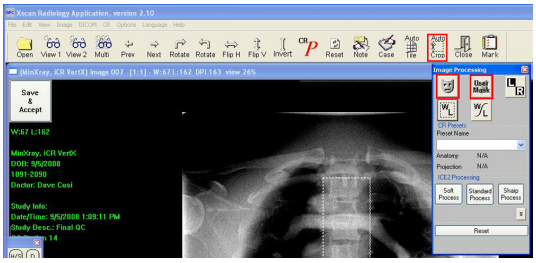


8. The preview window will display the image as it is scanning. Once it has finished scanning it will automatically import the image into QPC XSCAN32.
9. Open the scanned image by double clicking on the thumbnail.

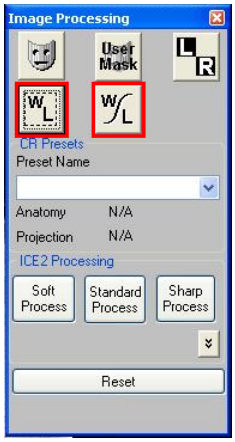
10. Rotate/Flip to correct orientation using the Rotate and Flip buttons in the main tool bar.


Xscan Radiology Application, version 2.10
File Edit View Image DICOM CR Options Language Help
Open View 1 View 2 Multi Prev Next Rotate Rotate Flip H Flip V Invert Reset Note Case Auto Tile Auto Crop Close Mark

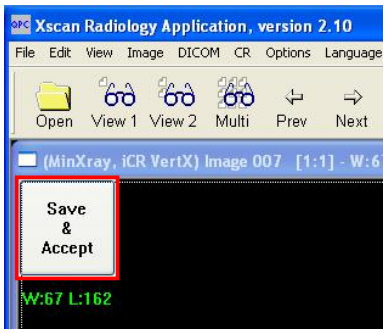
11. Remove any collimation by using the Auto Crop(located in the main tool bar), Mask, or User Mask (located in the Image Processing dialog) functions.



12. Window/Level the image using the Window/Level or Smart Box tools.



13. Accept and Save the image to save the processing and W/L settings by clicking the **Save and Accept** button in the upper left hand corner of the image.


Xscan Radiology Application, version 2.10
File Edit View Image DICOM CR Options Language
Open View 1 View 2 Multi Prev Next
(MinXray, iCR VertX) Image 007 [1:1] - W:6
Save & Accept
W:67 L:162

14. Return to the *Patient Information* window. Select the patient(s) to send to a PACS or viewing station. If you wish to send more than one patient, hold the Ctrl key down

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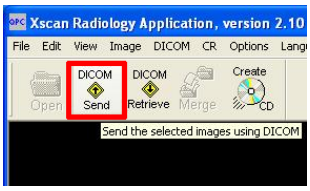
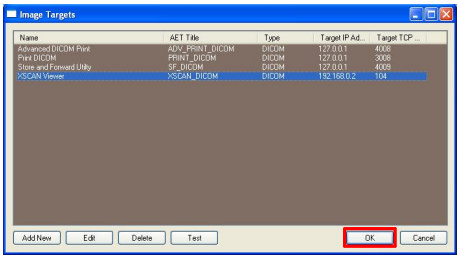
and left mouse click to select multiple patients.

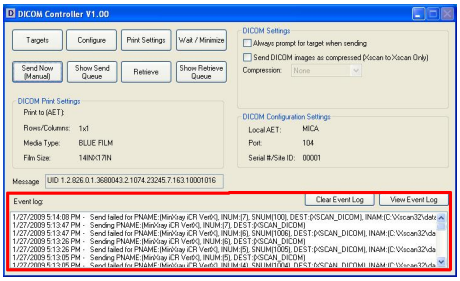
15. After selecting the patient(s), click the **DICOM Send** button.



16. The *DICOM Targets* window will appear, select the desired target, then click **OK**



17. The results of the DICOM Send will appear in the DICOM Controller window's Event log.



5.3 Schedule of Maintenance

The following is a schedule of maintenance for the *i*DR-L.

The following maintenance may be performed by end users:

Maintenance Procedure	**Frequency**
Clean *i*DR-L exterior covers	Monthly

The following *i*DR-L maintenance must be performed by an ***i***CRco authorized service engineer only:

Maintenance Procedure	Frequency
Clean IP Plate	Bi-yearly
Clean mirrors	Yearly
Vacuum inside case	Yearly
Clean fan filters	Monthly or when visibly dirty.

The following *i*DR-L calibration maintenance must be performed by an ***i***CRco authorized service engineer only:

Maintenance Procedure	Frequency
Check image performance (Contrast/Noise Ratio and Spacial Resolution)	Quarterly
Perform Exposure Index calibration	Yearly

5.4 Periodic Cleaning

Periodic cleaning of ***i***CRco products should be done on a monthly basis.

5.4.1 Cleaning the Outside of the *i*DR-L

Note It is important that the covers remain on the *i*DR-L at all times. The covers should only be removed for service by an ***i***CRco authorized technician, then immediately replaced.

⚠ CAUTION Do **not** clean the galvo mirror. Dust and fibers in the laser beam path may affect the radiographic image.

The outside covers of the *i*DR-L should be cleaned with a slightly dampened cloth or a dry cloth moistened with Ball®SUNUP®glass cleaner or Sprayway©glass cleaner.

5.5 *i*DR-L Cleaning and Disinfection Procedure

If the *i*DR-L is visually contaminated with blood or body fluids, remove the blood and/or body fluids, then follow Section 5.5.3 prior to use.

⚠ CAUTION Consult the manufacture's Material Safety Data Sheet before use.

5.5.1 Disinfection Materials

1. Sporicidin® Disinfectant Solution and Spray

2. Sporicidin® Disinfectant Towelettes

5.5.2 Disinfection method to be performed after each patient use

1. Wipe the Carbon Fiber material with Sporicidin® Disinfectant Towelettes or Sporicidin® Disinfectant Solution and Spray.
2. Allow to air dry.

5.5.3 Higher level of disinfection

1. Unplug form the power source.
2. Clean the exterior surface with Sporicidin® Disinfectant Towelettes or Sporicidin® Disinfectant Solution and Spray.
3. The surface shall remain wet for ten minutes.
4. Then allow to air dry.

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6. QPC XSCAN32 Software Functions

6.1 Creating/Editing Patients

1. Open XSCAN, then click the **New** button in the *Patient Information* dialog. Alternatively, if the patient is already in the patient list, select the patient and click the **Edit** button on the Patient information dialog.
2. Enter the patient details into the appropriate fields in the dialog box. The user also needs to enter the exam information for the patient.
   Note Last Name, First Name, Date and DOB are required fields. The use can also make Patient ID a required field by clicking on the *Options menu* → *Preferences* → *Defaults* tab.
3. Click the **Save** or **Save and View** button after the patient details have been entered.

   Note The **Save and View** button will create/edit the patient and open the exam immediately for viewing or scanning of images.
4. To create an additional exam for the patient, return to the *Patient* dialog, then click the **New** button under *Exam*. Enter in the exam information.
   Note When the user opens an exam with no images QPC XSCAN32 will automatically open the default scan interface. The user can change the the default scan interface by clicking on *Options* → *Preferences* → *Scanner* tab.

6.2 Scan Interface

The scan interface is used to start the scan of the cassette. It is available by clicking the **Scan** button in the main toolbar, after opening a patient from the Patient Worklist. The user may also cancel, rest, and close the scan interface, as well as select the appropriate anatomy, select High Energy X-ray, enter a barcode, and switch to the Mammography interface (if enabled).

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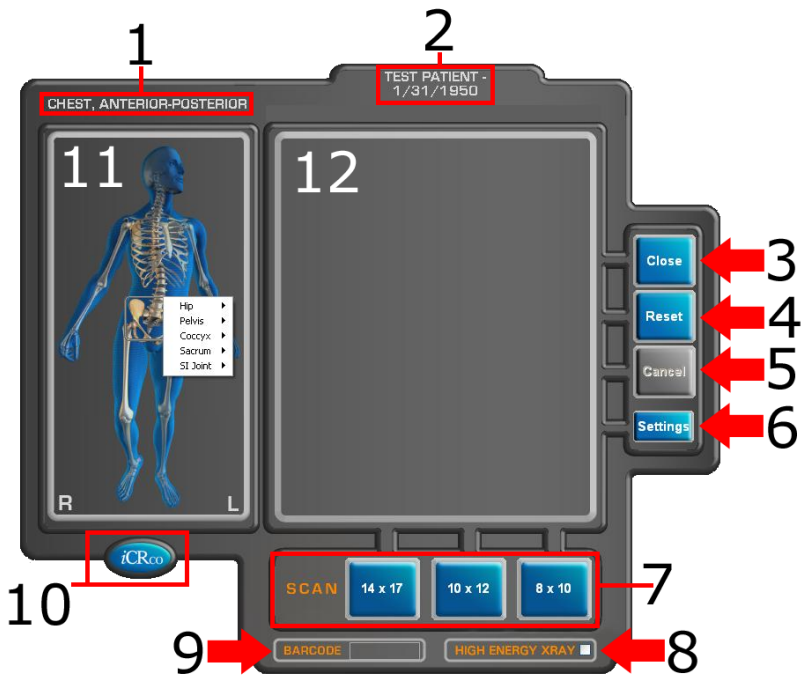

1. Shows the currently selected anatomy
2. Shows the current patient name & birth date
3. Close: This button will close the scan interface (it will **not** close XSCAN)
4. Reset: This button will return the CR unit to the "home" position
5. Cancel: This button will stop the CR unit while scanning. Note that the user will have to re-expose the cassette, as the image will not be saved.
6. Scanner Settings: various hardware settings for the CR unit (for service use only).
7. Cassette Size Selection: Select the cassette size you are using. When the button is clicked, the unit will begin to scan.
8. High Energy X-ray: Used to give cassettes a "deep erase." This will remove any latent energy from high energy techniques
9. Barcode entry field: Enter the barcode of the cassette here, if using barcodes in your workflow.
10. Regional Scanning interface button (if enabled): use this button to toggle between the full 14x51" scan and a Regional Scan.
11. Anatomy selection: mouse over the appropriate anatomy, then select the view from the pop-up dialog.
12. Scan preview: once the user has begun the scan, a preview image will appear as the plate scans.

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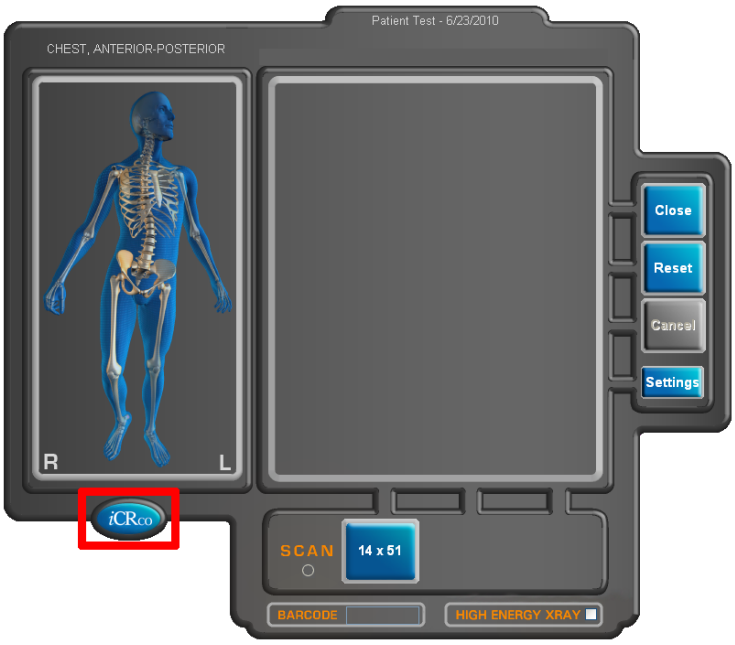
6.3 Regional Scanning

The *i*DR-L offers the User six (6) different sizes for scanning:

- 14x51″ (the whole plate)
- Region 1 (The top 14x17″ area)
- Region 2 (The middle 14x17″ area)
- Region 3 (The bottom 14x17″ area)
- Region 1 and 2 together (resulting in a 14x34″ image)
- Region 2 and 3 together (resulting in a 14x34″ image)

Toggling between these options is accomplished by clicking the ***i***CRco button located just under the Skeleton in the Scan Interface:



6.4 Default Mouse Functions for Image Manipulation

Windows / Level Images

The middle mouse button is used to window / level images. Hold down the middle mouse button (holding the CTRL key and right mouse clicking will also window/level) and move the mouse vertically to adjust the brightness of the image or move the mouse horizontally to adjust the contrast of the image.

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Magnify (Zooming) Images

The right mouse button is used to magnify images. Hold down the right mouse button and move the mouse vertically to magnify or reduce the size of the image. (Alternatively the user can hold down the middle mouse button and move the mouse vertically to magnify.) To magnify an area of interest in the image, simultaneously hold down the Shift key and the Left mouse button and move it over the area of interest. Similarly, on a laptop the user may right click and drag along the touch pad interface to zoom.

Panning Images

Hold down the Left mouse button and move the mouse around the screen. This is useful when the image is magnified. To pan through the image faster, simultaneously hold down the Ctrl key and the Left mouse button.

6.5 Image Processing Dialog Box

Window / Level

Holding the middle mouse button (simultaneously holding the CTRL key and right mouse clicking will also window/level) down and moving the mouse vertically will adjust the level and horizontally will adjust the window.

To window and level through more gray values at a time, simultaneously hold down the Ctrl key and use the Middle Scroll button. This will perform a faster window and level on images with a large histogram (i.e. CR and DR images). To window and level through less gray values at a time (i.e., single step through window and level values) simultaneously hold down the Shift key and use the Middle Scroll button. This will perform a slower window and level on images with a smaller histogram (i.e., CT and MR images).

Smart Box Window/Level

The Smart Box feature can be activated from the processing toolbar by clicking the icon in the toolbar. A box enclosed in dashed lines will appear on the image. This is the Smart Box's representation of the Auto Window/Function feature.

To resize the smart box hold down the left mouse button on the border of the smart box and move the mouse forwards and backwards (or up and down if adjusting the bottom edge).

To resize both edges of the smart box at the same time hold down the Ctrl key and Left mouse button on any of the four corners of the smart box and move the mouse.

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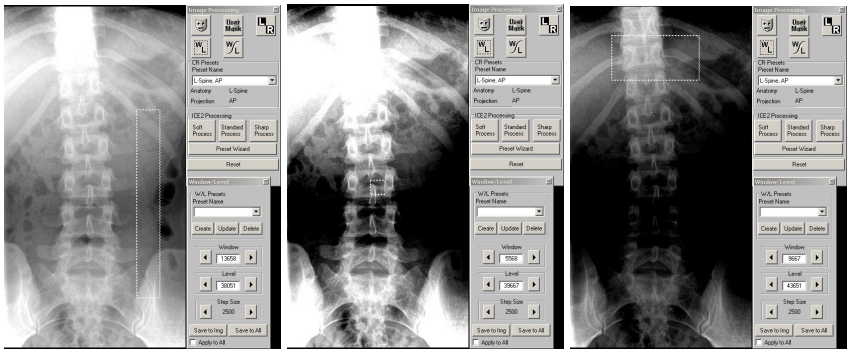
To move the smart box around the image hold down the left mouse button anywhere inside the smart box and drag the mouse around the image.



The Smart Box's size and position can be adjusted to yield different results. This allows the user fast and efficient image processing methods.

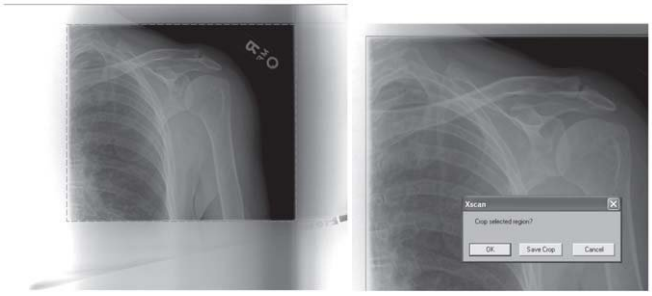
Left and Right CR Markers

1. Open an image for viewing.
2. Select the Left/Right Markers button to apply a Left or Right marker to the image.
3. Select either the Left or Right marker. When the user clicks on the Left/Right Marker button the Left marker icon will appear. If the user clicks the Left/Right Marker button again, the Right marker icon will appear. Clicking again will toggle back to the Left marker.
4. Move the mouse onto the part of the image where the marker needs to appear. When the user moves the mouse over the image a Left or Right marker icon will appear in place of the mouse.
5. Click on the image to place the icon.
6. To remove the marker click on the Left/Right Marker button again.

CR Cropping

1. Open the image that needs to be cropped.
2. Select the **Crop** button from the main toolbar.
3. Hold down the left mouse button to select the region that needs cropping.
4. When the mouse is released, the area to be cropped will be surrounded by a red line. A message box will appear asking to confirm the selected region.
5. To confirm the region, click **Ok**.
6. The new image will be created in the same study and will open automatically for viewing.

Cropping Example:

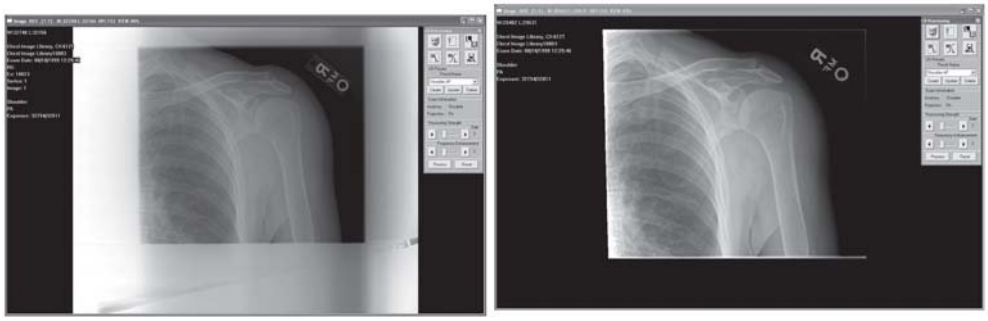


Before **After**

CR Masking

1. Open an image for viewing.
2. Click the **Mask** button.
3. To remove the collimation mask, select the **Mask** button again.

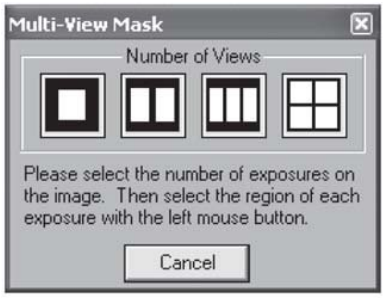
CR Masking Example



Before Masking After Masking

CR User Masking

1. Open an image for viewing.
2. Click the **User Mask** button.
3. Select the number of views from the *Multi-View Mask dialog*, (i.e., if there are two hand exposures on one image, select the two-view button).


Multi-View Mask
Number of Views
Please select the number of exposures on the image. Then select the region of each exposure with the left mouse button.
Cancel

4. Hold the left mouse button down on the start region and move the mouse to the end of the mask region.
5. Repeat step 4 for each exposure. After the user has completed selecting the number of exposures, the masks will appear on the image.
6. To remove the User Mask, select the **User Mask** button.

Moving Icon Thumbnails

1. Open a patient study for viewing.
2. Hold down the Ctrl key while clicking the left mouse button on the image that needs to be moved. The arrow icon will change to a hand icon. The icon highlighted in red shows the location where the image will be dropped.
3. To drop the icon, simply release the left mouse button.

Note If the moving icon is highlighted, this indicates that it will return to its original position. If an icon is dragged forwards in position (i.e. the image number of the highlighted icon is higher than the moving icon) then all icons between its original position and its new position will move backwards and each image number decreases by one. If an icon is dragged backwards in position (i.e. the image number of the

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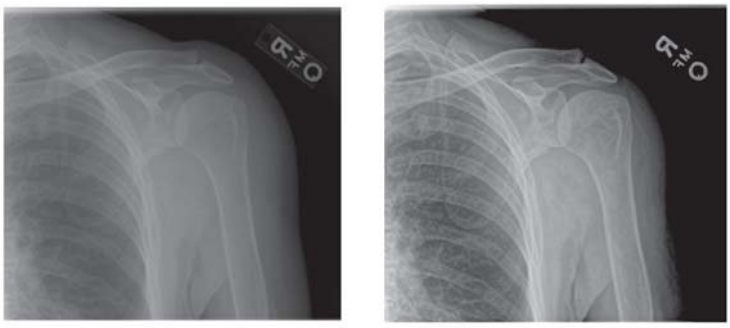
highlighted icon is less than the moving icon) then all icons between its original position and its new position will move forward and each image number increases by one. If no icons are highlighted when dragging, then the image will be returned to its original position.

CR Processing

1. Open an image for viewing.
2. Select an anatomy from the *CR Preset* box.
3. Click the **Process** button to begin the processing.
4. The user may press the **Reset** button to restore the original image data set.
   Note the user can also press the Process button again and the original data set will be automatically restored and processed again.
5. To optimize processing strength, change Gain and Frequency Enhancement as needed.
   Note The user can update the CR preset by selecting the Update button, which will ensure that these processing strengths will be used each time with the currently selected anatomy.

CR Processing Example:



Original Image Processed Image

About Advanced ICE-2 Processing

ICE-2 is a state-of-the-art image processing package that automatically enhances and optimizes the diagnostic quality of digital radiographic images. ICE-2 enables the user more flexibility through the "soft" and "sharp" processing options. The "soft" option produces an image with less enhancement thereby making the image more "film-like." The "sharp" button applies more enhancement to the image.

ICE2 Example: Lateral Lumber Spine

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Conventional Processing ICE-2 Processing

Clicking the drop down menu button located below the "sharp" option gives the user the ability to refine the image further. After the user clicks on the drop down menu, an interface appears showing two sliders. The first slider enhances edges and contrast as the slider is moved to the right. The second slider adjusts image smoothness. Adjust each slider until the desired result is achieved. Click on the **Save As** button to save the settings for Soft, Standard or Sharp processing.

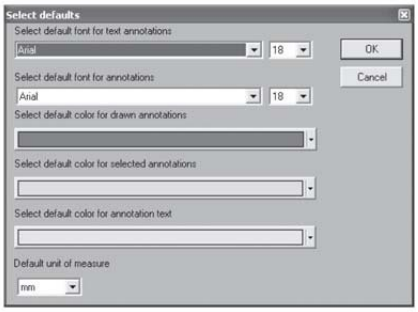
6.6 Annotations

Hide / Show Annotations

Selecting the Hide / Show Annotations button will toggle the visibility of the Annotations tool pallet.

Annotation Defaults

Used to change the default font name, font size and colors.
Select the Defaults D button on the annotations toolbar.



Embed Annotations in Image

Clicking on the Embed Annotations in Image button will save all the annotations into the image, enabling the user to DICOM send images with annotations. If the annotations are not embedded, they will not be sent with the image when doing a DICOM send.

Line Annotations

Creates a straight line on the image.

1. Select the **Line** button from the annotations toolbar.
2. Left mouse click on the area of the image to set the first endpoint.
3. Move the mouse to where the second endpoint will be.
4. Left mouse click on the are of the image to set the second endpoint.

Extended Line Annotation

Creates a straight line that passes through the image.

1. Select the **Extended Line** from the annotations toolbar.
2. Left mouse click on the area of the image to set the first endpoint.

   Note The line will be extended through the entire image.
3. Move the mouse to where the second endpoint will be.
4. Left mouse click on the area of the image to set the second endpoint.

Arrow Annotation

Creates an arrow on the image, which points to a region of interest.

1. Select the **Arrow** button from the annotations toolbar.
2. Left mouse click on the area of the image to set the end of the arrow.
3. Move the mouse to where the arrow should point.
4. Left mouse click to set the second endpoint of the arrow head.

Cross Hair Annotation

Creates a cross hair on the image.

1. Select the **Cross Hair** button from the annotations toolbar.
2. Left mouse click on the area of the image to set the start point of the cross hair.
3. Move the mouse to where the second endpoint will be.
4. Left mouse click on the area of the image to set the cross hair.

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Free Hand Annotation

Allows user to draw freehand on the image.

1. Select the **Free Hand** button from the annotations toolbar.
2. Hold down the left mouse button on the part of the image that is desired to start drawing then drag the mouse.
3. Continue to hold the left mouse button and draw as necessary .
4. Release the left mouse button to end the freehand drawing.

Ellipse Annotation

Creates an unfilled ellipse on the image. This feature is used to show a region of interest on the image.

1. Select the **Ellipse** button from the annotations toolbar.
2. Left mouse click on the area of the image to start the ellipse.
3. Move the mouse to where the ellipse will end.
4. Left mouse click to set the ellipse in place.

Rectangle Annotation

Creates an unfilled box on the image. Used to show a region of interest on the image.

1. Select the **Box** button from the annotations toolbar.
2. Left mouse click on the area of the image to start the box.
3. Move the mouse to where the box will end.
4. Left mouse click to set the box in place.

Text Annotation

Creates a text annotation on the image.

1. Select the **Text** button from the annotations toolbar.
2. Left mouse click on the area of the image to set the upper left corner of the text box.
3. Move the mouse to where the text box will end.
4. Left mouse click to set the size of the text box.

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5. The text box will become white with a flashing cursor. Type text.
6. Click anywhere on the image to end the text box.

Measurement Annotation

Used to measure the distance of a straight line on the image. This can be in inches, cm, mm and pixels.

1. Select the **Measurement** button from the annotations toolbar.
2. Left mouse click on the image to set the first endpoint of the measurement.
3. Move the mouse to where the endpoint of the measurement will be.
4. Left mouse click to set the endpoint of the measurement. The measurement will appear below the line.
5. To place the text in this default position left mouse click on the same point again. To move the text out of the way, move the mouse to the desired location and left mouse click to set the placement of the text.

Calibration

The calibration tool compensates for image magnification. It will allow the user to take an object of known length (a coin, ruler, etc that is not susceptible to measurement distortion), draw a linear measurement, and assign a length value such that measurements made with other tools will be accurate in the unit of measurement.

Angle Measurement Annotation

Used to draw an angle on the image.

1. Select the **Angle Measurement** button on the annotations toolbar.
2. Left mouse click on the image to set the vertex (center point) of the angle.
3. Move the mouse to where the endpoint of the first vector will be.
4. Left mouse click to set the endpoint of the first vector.
5. Move the mouse to where the endpoint of the second vector will be.
6. Left mouse click to set the endpoint of the second vector. The angle measurement will appear.

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7. To place the angle text in this default position left mouse click on the same point again. To move the angle text out of the way or to change angles, move the mouse to the desired location and left mouse click to set the placement.

Cobb Angle Annotation

Used to draw a cobb angle on the image.

1. Select the **Cobb Angle** button on the annotations toolbar.
2. Left mouse click on the area of the image to set the first endpoint of the first line.
3. Move the mouse to where the second endpoint of the first line will be.
4. Left mouse click on the area of the image to set the second endpoint of the first line.
5. Left mouse click on the area of the image to set the first endpoint of the second line.
6. Move the mouse to where the second endpoint of the second line will be.
7. Left mouse click on the area of the image to set the second endpoint of the second line. The angle measurement will appear.
8. To place the angle text in this default position left mouse click on the same point again. To move the angle text out of the way, move the mouse to the desired location and left mouse click to set the placement.

Heart to Lung Ratio Annotation

Used to find the heart to lung ratio.

1. Select the **Heart to Lung Ratio** button on the annotations toolbar.
2. Left mouse click on the area of the image to set the first endpoint of the first line.
3. Move the mouse to where the second endpoint of the first line will be.
4. Left mouse click on the area of the image to set the second endpoint of the first line.
5. Left mouse click on the area of the image to set the first endpoint of the second line.
6. Move the mouse to where the second endpoint of the second line will be.
7. Left mouse click on the area of the image to set the second endpoint of the second line. The ratio measurement will appear.

Center Line Annotation

Used to find the center line of four points.

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1. Select the **Center Line** button on the annotations toolbar.
2. Left mouse click on the area of the image to set the first point.
3. Left mouse click on the area of the image to set the second point
4. Left mouse click on the area of the image to set the third point.
5. Left mouse click on the area of the image to set the fourth point. The center line of these four points will be drawn on the image.

Center Point

Used to find the center between two user settable points.

1. Select the **Center Point** button on the annotations toolbar.
2. Left mouse click on an area to set the first point (it will appear as an X).
3. Left mouse click on an area to set the second point (it will appear as an X).
4. A third, large X will appear in the center of the two other Xs.

Probe

Used to view the X & Y pixel coordinates and the grayscale value for the point.

1. Select the **Probe** button on the annotations toolbar.
2. Move the mouse to the desired point.
3. Left mouse click and hold, and the X & Y coordinates and gray scale value will be displayed.

   Note While holding down the left mouse button, the user can drag the mouse pointer and the values will change.

Scale

Used to indicate measures (like increments on a ruler) on the top, bottom, or sides of the image.

1. Select the **Scale** button from the annotations toolbar.
2. Set the desired parameters in the dialog box.
3. Click **Ok**, and the measures will appear on the image.

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Templates

Used to load and draw custom templates.

Select the **Templates** T button on the annotations toolbar.

Measurements Units

Used to toggle between the current measurement units. inch cm pix mm

Delete All Annotations

Used to permanently remove all annotations from the currently selected images.

Select the **Delete All Annotations** ☒ button.

Deleting Annotations Individually

1. Select the annotation.
2. Right mouse click on the annotation.
3. Select **Delete** from the pop-up menu.

Selecting Annotations

1. Move the mouse over the annotation. The mouse pointer will become a pointing hand.
2. Left mouse click on the annotation to select it. The annotation will become a dotted line with several handles.

Moving Annotations

1. Select the annotation.

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2. Move the mouse over the annotation onto any part of it except the handles (i.e. small boxes). The icon will change to the moving annotations icon.
3. Left mouse click on the annotations and drag it anywhere on the image.

Resizing Annotations

1. Select the annotation.
2. Move the mouse over the annotation (onto any of the handles). The icon will change to the resizing annotations icon.
3. Left mouse click on the annotation handle and drag it anywhere on the image.

Note For measurement annotations the size/angle will change accordingly. One of the handles provided for measurement annotations will also allow the user to reposition the text.

6.7 Patient CD/DVD Creator

Note CD/DVD Creation Software is *NOT* part of the QPC XSCAN32 Software. This section is optional for users who already have CD/DVD Creation Software already installed on their respective PCs.

1. In the patient information window select the patient(s) to be placed on the CD/DVD. To select multiple patients hold down your Ctrl key on the keyboard and using your left mouse button select each patient.
2. Click on the Create CD button in the toolbar. Selected patients will be copied into the patient CD layout folder (C:_XscanCDFolder).

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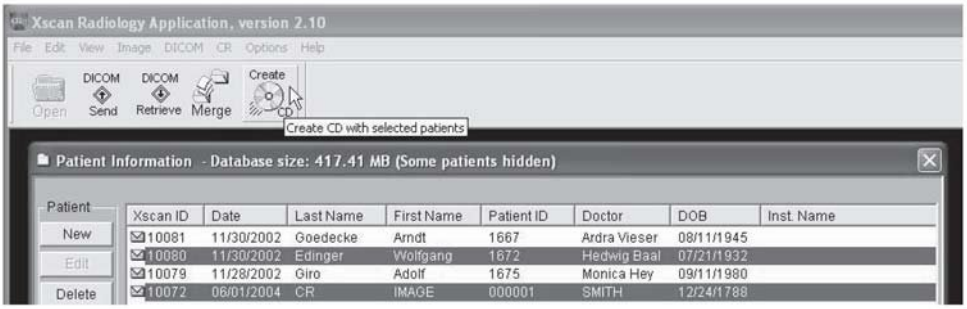
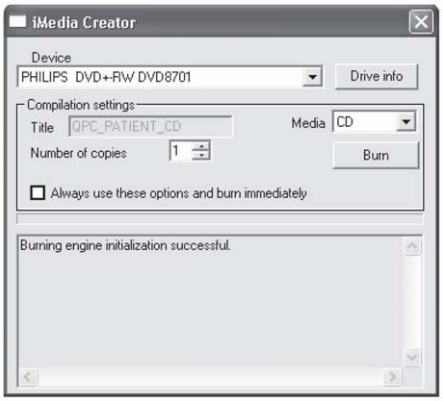

Xscan Radiology Application, version 2.10
File Edit View Image DICOM CR Options Help
Open
DICOM Send
DICOM Retrieve
Merge
Create CD
Create CD with selected patients
Patient Information - Database size: 417.41 MB (Some patients hidden)
Patient
New
Edit
Delete
Xscan ID Date Last Name First Name Patient ID Doctor DOB Inst. Name
10081 11/30/2002 Goedecke Arndt 1667 Ardra Vieser 08/11/1945
10080 11/30/2002 Edinger Wolfgang 1672 Hedwig Baal 07/21/1932
10079 11/28/2002 Giro Adolf 1675 Monica Hey 09/11/1980
10072 06/01/2004 CR IMAGE 000001 SMITH 12/24/1788

Note If this is the first time using the patient CD creator feature a prompt will appear indicating the user to browse for the location of the DVD/CD Creator software. Alternatively, if Nero software is already installed on the PC, select the option *Use Nero scripting to create CD/DVD.*

Using Nero Scripting

1. When the software has finished initializing and copying the patient CD, the Nero scripting dialog will appear.
2. Select the device to burn to. (if multiple drives are present)
3. Put the CD/DVD into the drive and select the **Burn** button.
4. The drive will eject media once it has completed. Click the **Burn** button again to make multiple copies (or alternatively set the Number of copies option before burning).



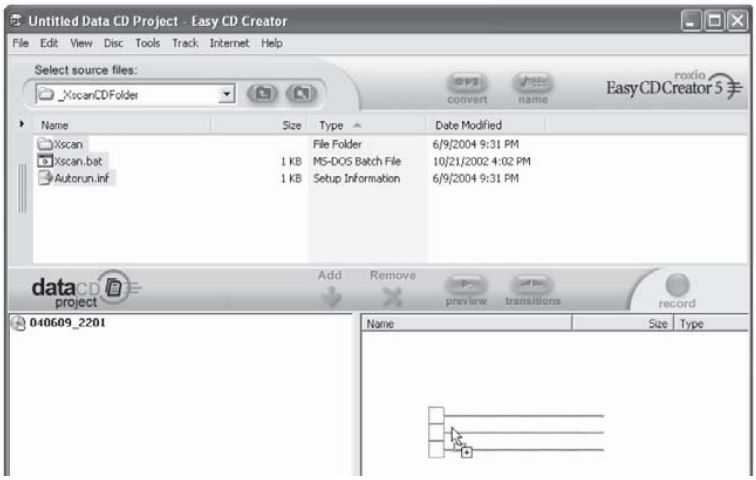
Using other CD/DVD recording software

1. When the software has finished initializing and copying the patient CD, a 'Ready to create CD' prompt will appear, select **Yes**.
2. The DVD/CD Creator software will open. Select source folder *C:_XscanCDFolder* and drag the contents of the Xscan CD Folder folder and two files into the data project region.

   Note The user must not create their own folders on the CD/DVD. The autorun.inf file must appear in the top level (under the root directory) of the CD/DVD.

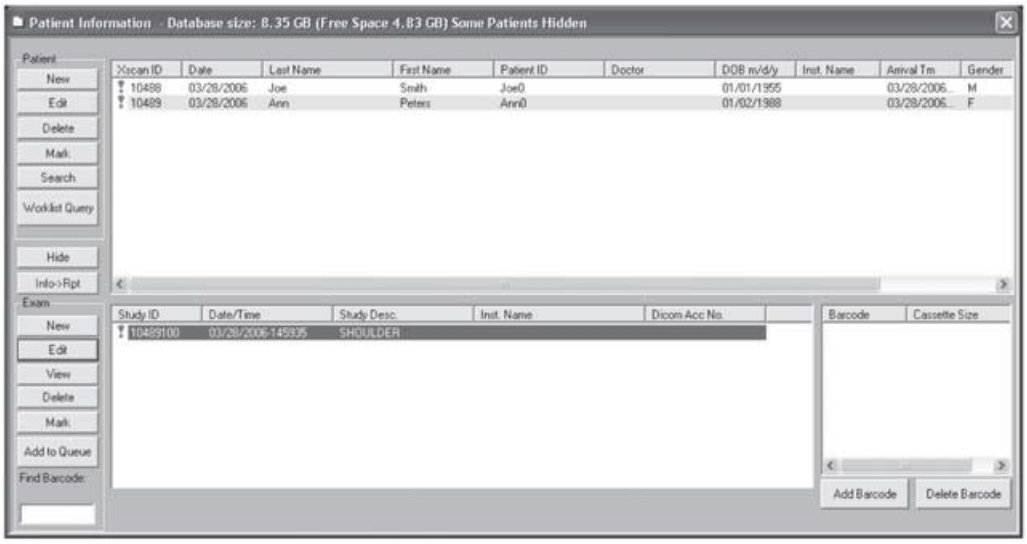
Select source folder location C:_Xscan CDFolder

The following folders and files are to be copied onto a DVD/CD:
* Xscan folder
* xscan.bat
*Autorun.inf



3. Click the Record button in CD Creator software.

6.8 Associating a Barcode with a Study



1. In the patient information window, enter patient and study information.
2. Select patient and study.
3. Select **Add Barcode** button.
4. Using a barcode reader, scan the barcode of an unexposed cassette.
5. The barcode will be added into the barcode list with the default cassette size 14x17.
6. Repeat steps 3 to 5 for each cassette that will be associated with the study.

Note The user can change the cassette size by clicking under the column Cassette Size and selecting the actual size. This will be saved for future use in the database.

Note The user can remove the association by selecting the barcode from the list and selecting the Delete Barcode button.

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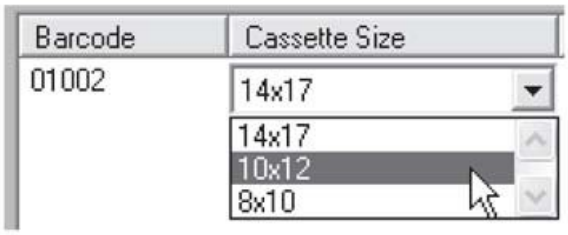

6.9 Finding Barcodes and Scanning Images

1. In the patient information window, select the **Find Barcode Edit** box.
2. Using a barcode reader, scan the barcode of the exposed cassette.
3. Select the anatomy information for the study.
   Note This can be corrected later in QPC XSCAN32 when viewing the images.
4. Load cassette into the CR unit.
5. Select the appropriate scan button.
6. QPC XSCAN32 will automatically open the study that the cassette is associated with. The scan interface will open with the details of the associated patient.

7. The image will be imported into QPC XSCAN32 when it has completed scanning. The association with that cassette barcode and the study will be removed and the cassette can be reassigned to another patient.

Other Tips

The scan interface also allows the user to find barcodes in the database. The patient information displayed in the scan interface will change depending on the barcode selected for scanning.

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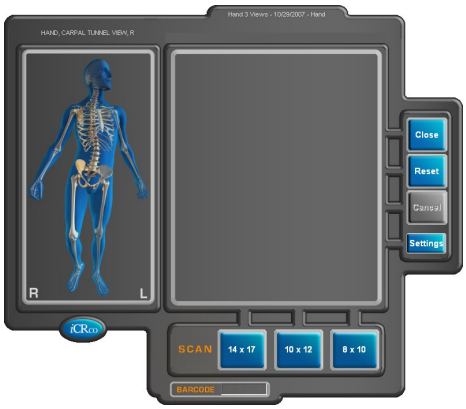


The image below indicates that the image will appear under the patient Joe Smith and the barcode for the cassette that will be scanned is 01003.

There is an option in the scan interface settings that requires the user to scan the barcode before they are able to scan cassettes into the interface. In other words they have to tell the scan interface which barcode they are scanning. If no barcode has been selected for scanning the user will be prompted to find a barcode.

6.10 Archiving QPC XSCAN32 Database

1. Open XSCAN.
2. Go to *File* → *Archive Database*.
3. The user is asked to confirm the archive process, click **Yes**.

4. Select the location to archive the database to.

5. When archiving is completed a message will appear informing the user of the archive location.
   Note the current date and time is used for the folder name of the archived database.

6.11 Restoring Archived Database

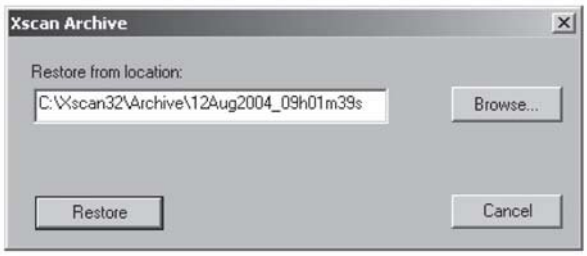
⚠ WARNING It is strongly recommended to backing up data to non-spinning media CD/DVD or an archive (PACS) with RAID capability to ensure no loss of data.

1. To restore an Archive, go to *File* → *Restore Archive*.

   Note The current database in QPC must be empty.

Archive Xscan
Archive (C:\Xscan32\Archive\24Aug2004_09h12m28s) is now complete. The serial number of your dicom module will be changed.
If using external storage media use the following label for future reference:
'24Aug2004_09h12m28s'
OK

2. Select the location of the database to restore.

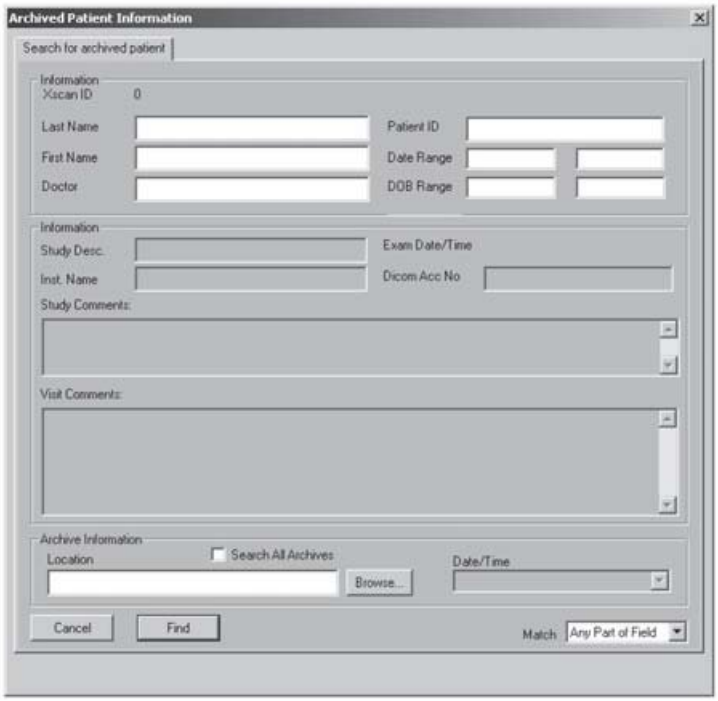


6.12 Searching QPC XSCAN32 Archive

1. Go to **File** → **Search Archives**.

2. To search a particular archive, select the archive location by selecting the **Browse** button.
3. Under Date/Time, select from the list of valid archives

4. The user can either:
   (a) Select **Find** to open the entire database.
   (b) Enter search values into the patient information fields. If the database contains a patient or multiple patients that match the criteria the database will be opened with the patient(s) selected. If the patient(s) could not be found you will be returned to the search dialog. For example, the user could enter "Th" in the First name field to find values such as "Thomas" and "Thelma."
5. The user can refine the search further by changing the Match field.



6.13 Modality Work List Query

6.13.1 Setting-up Modality Work List Query

1. Open QPC XSCAN32, then go to *Options* → *Preferences* → *Image Transfer* tab.
2. Check the box for *Use DICOM Modality Work List Query*.
3. Click the **Apply** button, then click the **Ok** button.
4. The *QPC XSCAN32 Modality Work List Query* window will appear.

Setting-up DICOM Modality Work List Query

Note The EMR/RIS/HIS must support DICOM Modality Work List Query.

1. In the *XSCAN32 Modality Work List Query* window, click the **Options** button.
2. Select the radio dialog check box for **DICOM Query**

   Note The User may also set the auto-query options in the *Options* dialog.
3. Click the **Ok** button.
4. In the *XSCAN32 Modality Work List Query* window, click the **Select Target** button.
5. In the *Image Targets* window, highlight the desired target, then click the **Ok** button.

Setting-up Work List HL7 Listen

Note The EMR/RIS/HIS must be able to **send** HL7 messages. It is not enough just to general the HL7 message.

1. In the *XSCAN32 Modality Work List Query* window, click the **Options** button.
2. Select the radio dialog check box for **HL7 Listen**.
3. Click the **Ok** button.
4. An HL7 Listen application will open.
5. Configure the EMR/HIS/RIS to send its HL7 messages to the IP address of the computer running QPC XSCAN32 on port 6000.

Setting-up Work List Text File Listen

Note The EMR/RIS/HIS must be able to **format** and **send** a plain text message.

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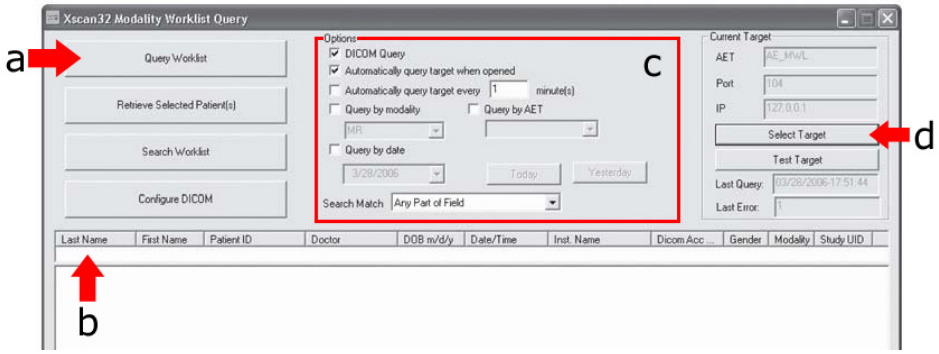
Note The Text File Listener should only be used if the EMR/RIS/HIS does not support DICOM Modality Work List Query or HL7 Messaging.

1. In the *XSCAN32 Modality Work List Query* window, click the **Options** button.
2. Select the radio dialog check box for **Text File**.
3. Instruct your EMR/RIS/HIS vendor to contact ***i***CRco Tech Support to obtain the text file format.

6.13.2 Using Modality Work List Query

1. To activate the Modality Work List Query interface click on the **Work List Query** button in the *Patient Information* window.
2. The QPC XSCAN32 Modality Work List Query dialog will open. Click on **Query Work List** button to query the HIS/RIS system.



(a) Query Work List Button

(b) Search fields. For example, to search for all patients with the last name Smith, select the Last Name field in the search box and type Smith and then click enter. Only the patients that have a last name of Smith will appear.

(c) The user can also specify query options such as:

- querying automatically when work list query dialog is opened.
- query on a timer (i.e. every 5 minutes)
- query by modality (i.e. CR patients only)

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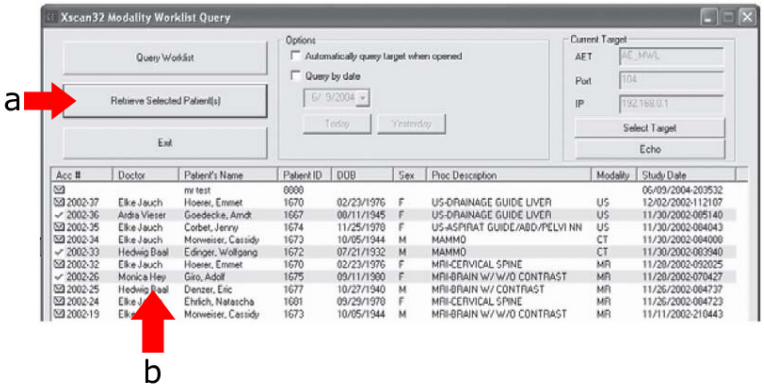
- query by AET
- query by Date (i.e. today's date only)

(d) Click here to select the target to query.
Note The user will only need to do this once.

3. The queried patients will appear in the patient list. Click on **Retrieve Selected Patient(s)** button to retrieve the patients into XSCAN32 database.



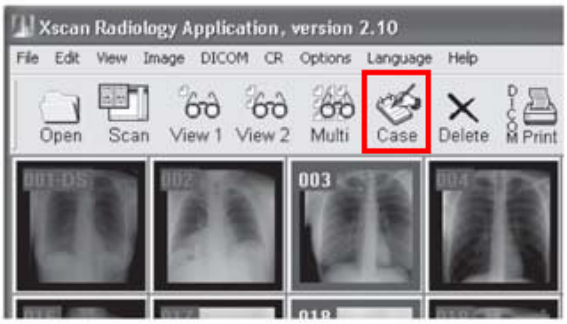
(a) Retrieve Selected Patient(s) button.

(b) Queried patients appear in the patient list. An envelope indicates a patient that has not been retrieved. A check mark indicates a patient that has been retrieved.

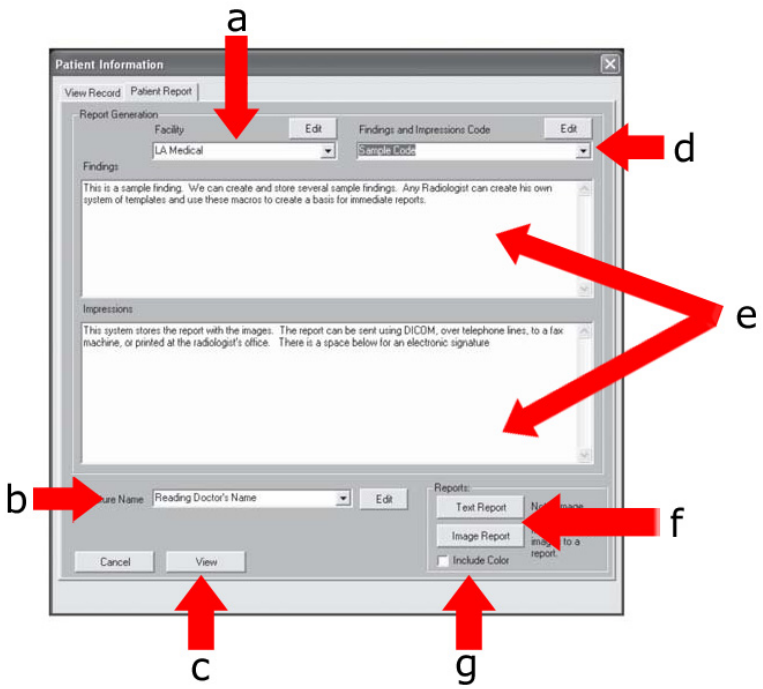
4. The patients will appear in the QPC XSCAN32 patient information window when retrieved from the Modality Work List Query dialog.

6.14 Report Writer

1. Open a patient study. Select the desired images to report. The user can have up to four images on one report (deselect all images if the user does not want to include any images in the report).
2. Click on the **Case** button in the toolbar.


Xscan Radiology Application, version 2.10
File Edit View Image DICOM CR Options Language Help
Open Scan View 1 View 2 Multi Case Delete Print
003

3. Select existing or add a New Facility.
4. Select existing or add a new Findings and Impressions Code. Add patient specific information to the Findings and Impressions fields.
   Note QPC XSCAN32 supports multiple page reports.
5. Select Signature Name for the reading doctors signature.
6. Click on the **Image Report** button
7. Click the **View** button to view the report.



(a) Facility field

(b) Signature/Name field

(c) View button

(d) US Color Option. To include color images, select this option.

(e) Image Report button

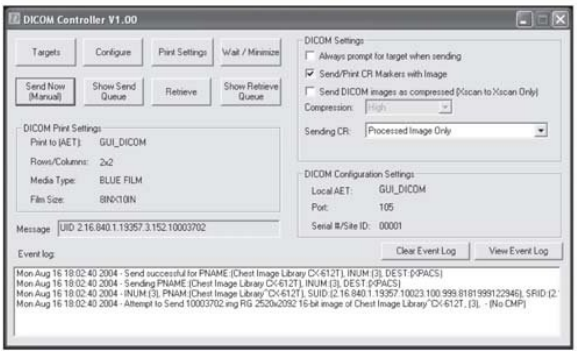
(f) Patient Specific Findings and Impressions fields

(g) Findings and Impressions Code field

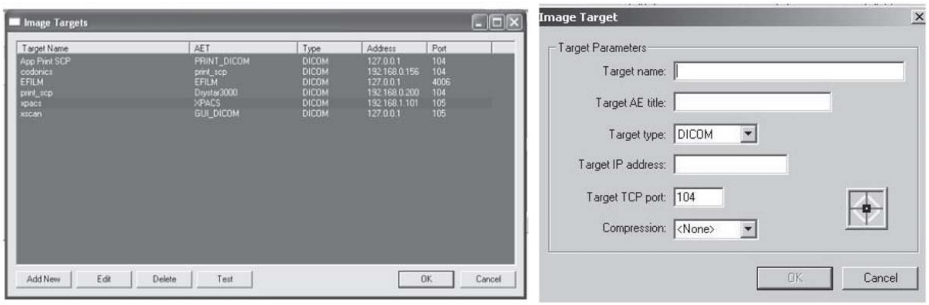
6.15 Setting Up DICOM Send

1. Open QPC XSCAN32.

2. Open DICOM Controller V1.00.
   Note If the user doesn't have the window in the task bar open, go to *Options* → *Preferences* → *Image Transfer Tab* → *Use DICOM to transfer images*.



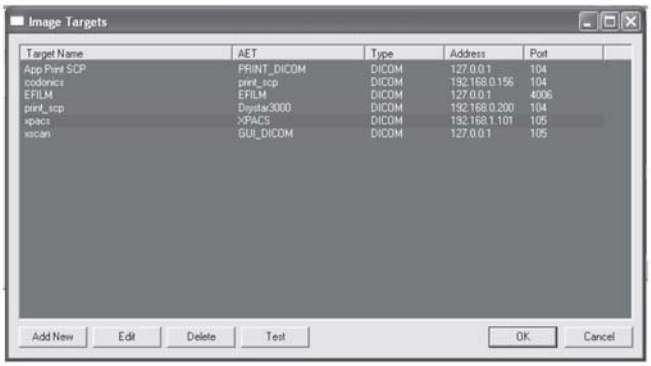
3. Click on **Targets** button and the Image Targets dialog will appear.



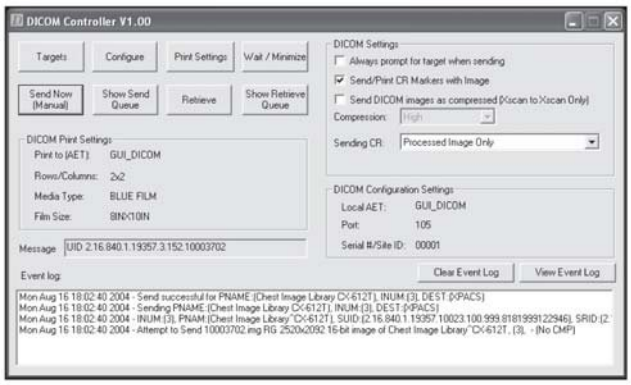
6.16 DICOM Send

1. Open a patient study for viewing and select the image icons to send.

2. Click on the **DICOM Send** button in the toolbar.
   Note This will only appear in the toolbar when the *Use DICOM to transfer images* option is selected in the *Image Transfer* preferences tab.



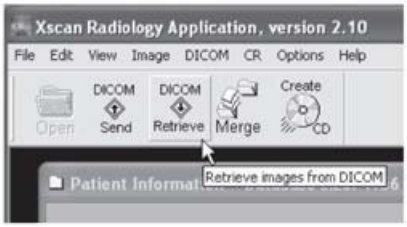
3. The *Image Targets* dialog will appear. Select the target(s) to send the selected images to.
4. Select **OK** to confirm the selected target(s).



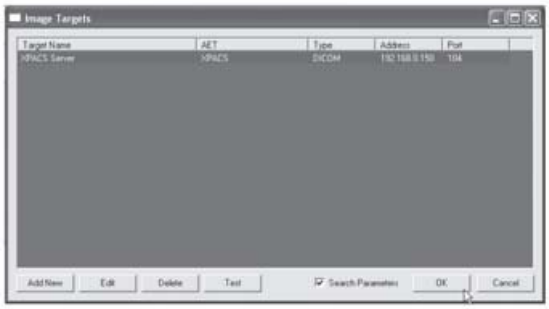
5. The status of the send will appear in the Event Log of the DICOM Controller window.
   Note If sending to another XSCAN32 application the user can turn compression on and select a compression type (low, medium, high).

6.17 DICOM Retrieve

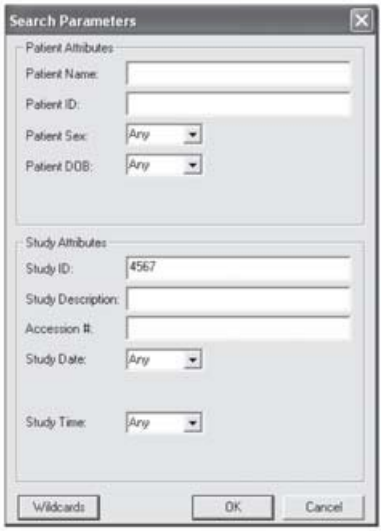
1. Open QPC XSCAN32
2. Click on the **DICOM Retrieve** button in the toolbar.
   Note This will only appear in the toolbar when the user has the *Use DICOM to transfer images* option selected in the *Image Transfer* preferences tab.



3. The Image Targets dialog will appear. Select the target to retrieve images from.
4. Select **OK** to confirm the selected target.



5. If the user has selected the Search Parameters option, then enter any relevant patient or study information. For example, to search on all patients with the name John Smith, type John Smith into the Patient Name field. To search on all patients with the last name Smith, type *Smith* into the Patient Name field. Where the asterisk * is used as a wildcard. To search on Study ID 12345, type 12345 into the Study ID field or 1234* to bring up all study ID's starting with 1234.
   Note It is not necessary to fill out all fields. For a description of the valid wildcards click on the **Wildcards** button.



6. The list of matching patients will be returned.
7. Select the patient(s) to retrieve from the list and click on the **Retrieve** button.

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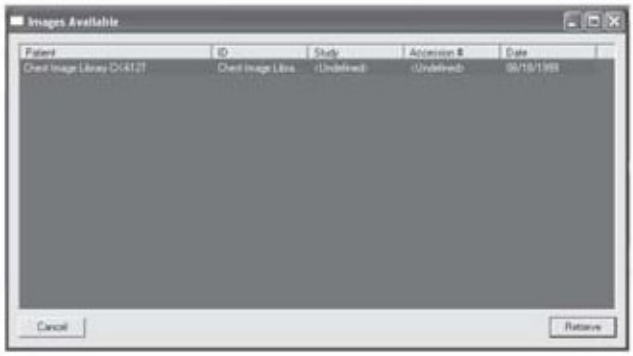
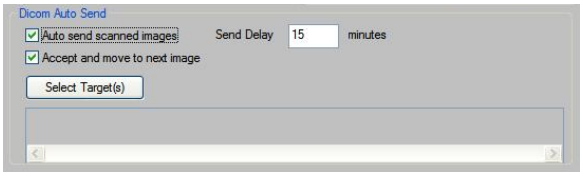


6.18 DICOM Auto-Send

6.18.1 Setting-up DICOM Auto-Send

1. Open QPC XSCAN32.
2. Go to *Options* → *Preferences* → *Image Transfer* tab.
3. Select the option **Auto send scanned images**.

Figure 6.1: Check the Auto send box to enable auto-send



4. Set the *Send delay*. The default is one (1) minute.
5. Click the **Select Target(s)** button.
6. Select the target(s) to send to. The User may Ctrl-click to select multiple targets.

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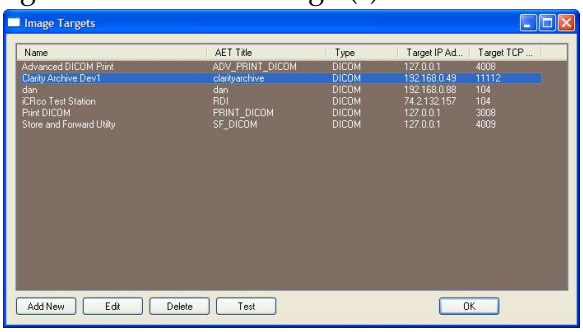
Figure 6.2: Select the Target(s) to auto-send to.



7. Click the **Apply** button, then the **Ok** button.

6.18.2 Using DICOM Auto-Send

1. Open an image for viewing.
2. Process and optimize the image as necessary.
3. Click the **Accept** button to accept and auto-send the image to the target. If the image is reprocessed or the orientation changed, the Accept button will reappear, and the image can be resent if necessary.

6.19 DICOM Store and Forward Utility

Setting up targets for forwarding

1. Under the *All Targets* list, select the target(s) to forward.
2. Click the **Add** ≫ button.
3. To remove target(s) from the forward to list, select the target under the *Forward To* list, then click the ≪ **Remove** button.

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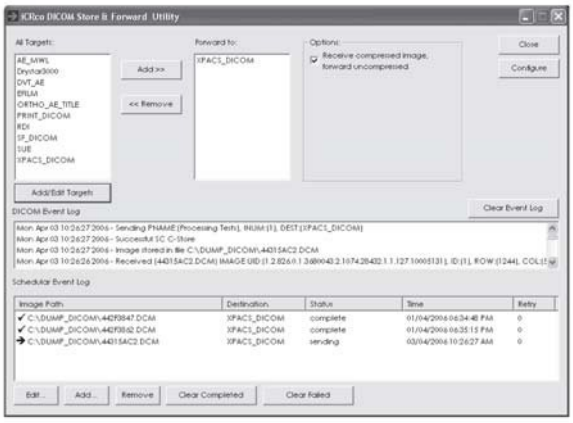


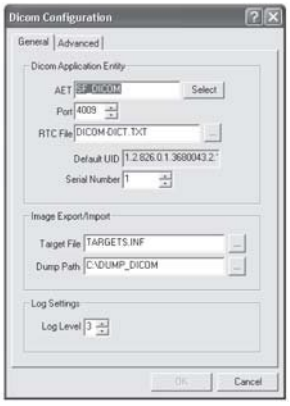
Configuring Store and Forward Utility DICOM settings

1. Click the **Configure** button.
2. The default DICOM settings are:

- AET SF_DICOM
- Port: 4009

Sending to Store and Forward Utility

1. From the sending application, select the images to send.
2. Then select the *Store and Forward Utility* as the DICOM target to send to (the AET of SF_DICOM). The images will appear in the Scheduler Event Log.
3. The Store and Forward Utility will keep retrying to send images if failed.
4. The status will be updated with sending, complete or transfer pending.



Options

The Store and Forward Utility defaults to receiving compressed images and forwarding them on decompressed. If you want to receive compressed images and send them on compressed to the PACS system, then deselect the option *Receive compressed image, forward uncompressed*.

Note The Store and Forward Utility may report the status as complete but the PACS system may still reject the image. If the image has an incorrect DICOM tag or it is a duplicate study, series or image UID. Always confirm that the PACS system has received the image before deleting images from the capture station.

6.20 HL7 Configuration

1. Open QPC XSCAN32.
2. In the *Patient Information* window, click **Worklist Query** button to open the *Modality Worklist Query* window.

3. In the *Modality Worklist Query* windows, click **Options**.
4. In the *Options* dialog box, check the radio dialog button for **HL7 Listen**.
5. Check the radio dialog boxes for *Mark retrieved patients* and **Automatically Query target when opened**.
   Note The user may also check the radio dialog box for **Automatically Query target every x minutes**, and set the time interval for the worklist query.
6. Click **Ok**. A new window will open called *HL7 DICOM Worklist Parser Port: 6000*.
7. In the *HL7 DICOM Worklist Parser* window, ensure that the port is 6000. If it is not, click on *File* → *Set Port* In new window, change port to 6000, then click **Ok**.
8. In the HL7 DICOM Worklist Parser *File* menu, make sure there is a check next to *Listen*. If there is not, click on **Listen** in the *File* menu to enable parser listening.
9. Make sure that in *System* → *HL7 Message Defaults*, that all boxes are checked.
10. Leave window open and let the parser retrieve HL7 messages. When an HL7 message is received, the window will have parsed text in it. Multiple messages can be received

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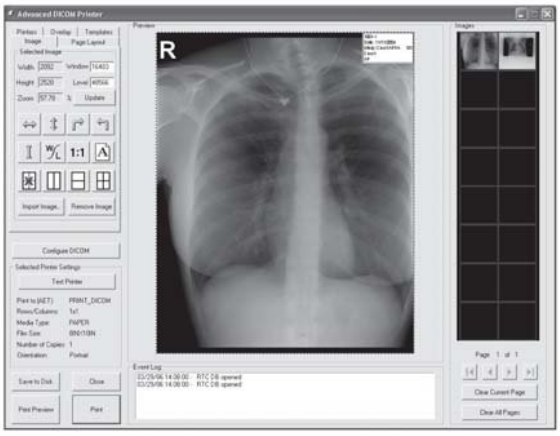
while window is open.

11. Click the **Query** button to get message information (If messages are not automatically queried).
12. Highlight messages that you want to retrieve and click **Retrieve**.

6.21 Advanced DICOM Printer

Select images for printing

In QPC XSCAN32, select the images to print in the image icon view, then select **DICOM Print** from the toolbar. The Advanced DICOM Printer application will open with the selected images imported into the right hand side. Alternatively, the user can select the region in the preview window where the user wants the image, then select the **Import Image** button.



Drag and Drop Images

To drag images into the print region hold the left mouse button down on one of the image icons on the right hand side and drag it into the preview window. A dragging cursor will appear as the user drags the image from the image icon window to the preview window. If the user is out of the accepted region for dropping, a cursor will appear letting the user know that this is not a correct region to drop the image into.

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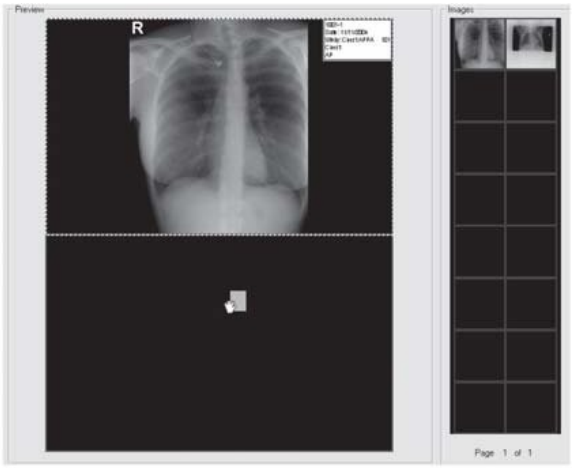
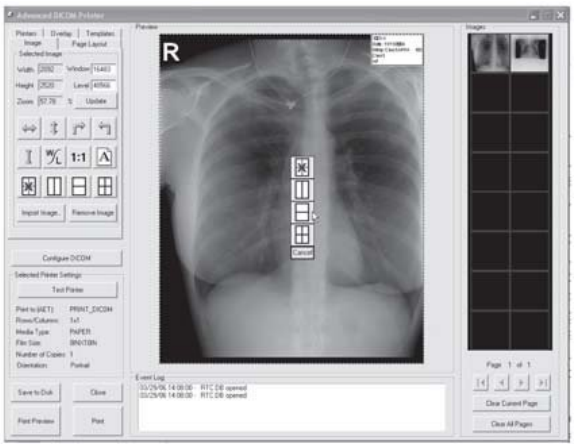


Split the preview window into regions

To split the preview window the user needs to first select the region to split. For example, if there are currently no divisions in the preview window then click anywhere in the preview window and a green line will appear around the window. This will enable the image division buttons. Alternatively, the user can press Shift+ right mouse click inside the preview window region to split it. A pop-up menu will appear with these division buttons (as the image to the right shows).



Select one of the image division buttons and the preview window will be divided into regions. To split one of these regions again select the specified region and again select one of the image division buttons. The user can drag and drop images at any stage. If the user has an image in the region that is desired, the interface will automatically move the image into the split regions. To remove a division, click in the region that has been split and click on the no-division button.

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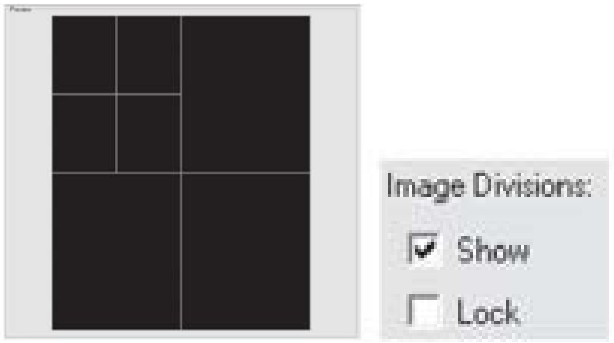


The user can show and hide the image divisions by clicking on the *Page Layout* tab, then click **Show and Lock** under *Image Divisions*. The user can view the current print settings by looking at the left hand side of the *Advanced DICOM Printer* dialog. To change these settings, or to view more settings, click on the *Printers* tab.

Manipulating Images in the Preview Window

The Advanced DICOM Printer allows the user to flip, rotate, zoom, pan, invert and window/level images. To manipulate the images select the image in the preview window (the selection will be shown by the green box surrounding the image).

The user can flip, rotate and invert by using the buttons on the left hand side of the DICOM Printer dialog.

The user can zoom by using the right mouse button on the selected image.

To pan the image use the left mouse button on the selected image.
Note The user can only pan the image when it is zoomed in. To window/level the user can either use the middle scroll button on the mouse or type the required window/level

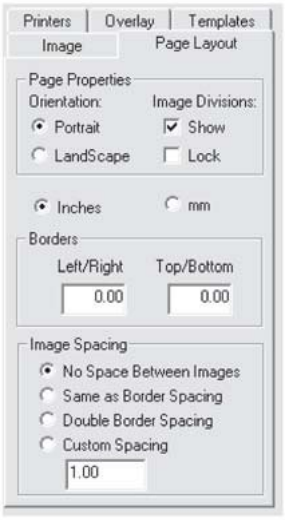
into the edit boxes on the left hand side of the *Advanced DICOM Printer* dialog. Then press the **Update** button to change the window/level for the image.

The user can also press the **1:1** button to tell the *Advanced DICOM Printer* dialog to print images at 1:1 resolution.

The user can use the *Orientation* button to change from landscape to portrait view.

Change margins

The margin tab permits the user to specify, in English or metric units, the size of the borders on the printed image. The top and bottom borders on the page can be adjusted independently of the borders for the left and the right hand side of the page.



Additionally, the user has the option to control the internal margins, which define the amount of space left between individual frames on a page with multiple images. Internal margins are defined as multiples of the print page border size.

By default, internal margins are the same size as the borders, with image margins on, the left and right hand side of each frame are equal to the left and right hand borders. Margins on the top and bottom of each frame are equal to the top and bottom borders of the printed page.

If the user intends to cut individual frames out of the printed page, it is recommended that internal margins are set to twice that of the page, which will give a uniform border size on the individual image segments. If it is necessary to maximize the amount of space on the printed page, the internal margins can be turned off altogether.

Saving and Loading Print Layout

The *Templates* tab allows the user to save and load pre-defined print layouts. There are five user defined layouts. Set up the layout on the preview window and then select one of the buttons labeled **Click here to save current layout!** The user will be prompted for a title.

To save more layouts click on the **Save Current Template** button. here the user can set a file name for the Layout. The default save location is $C:\backslash XScan32\backslash Layout\backslash Custom$.

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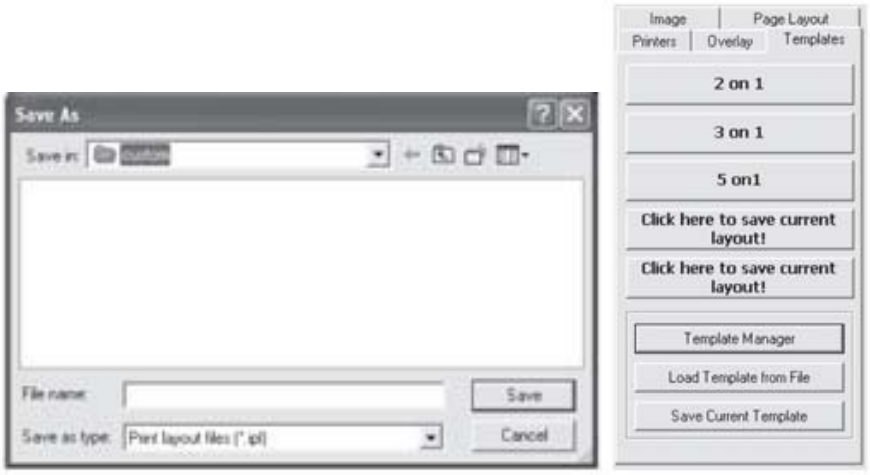
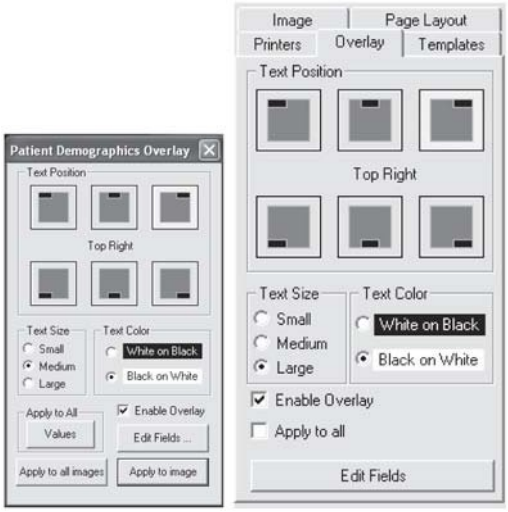


Adding patient demographics

Select the *Overlay* tab to bring up the patient demographic layout options.
From here the user can select:

- Text position (includes top left, top center, top right, bottom left, bottom center, bottom right),
- Text size (includes: small, medium, large),
- Text color (includes: white on black, black on white).



The user has the option to apply the current settings to every image in the print view or only in the currently selected image via the **Apply to all images** button or the **Apply to image** button.

By selecting the **Enable Overlay** check box the user can turn patient demographics overlay

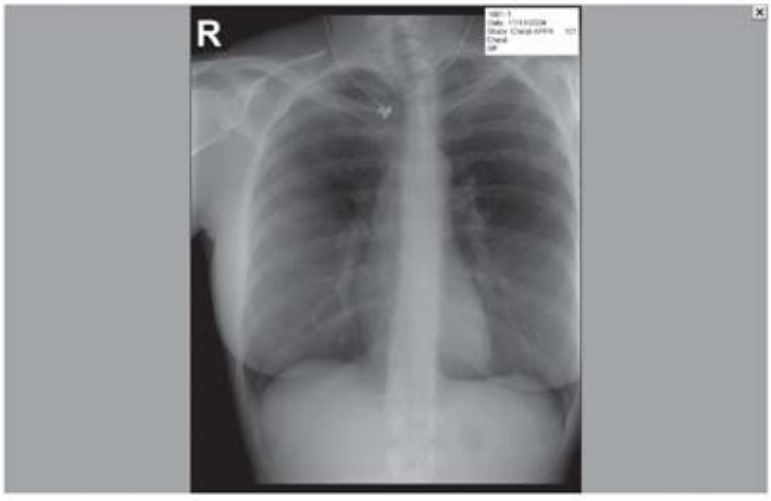
on and off for all images. The user can also edit the fields that are available on patient demographics overlay by clicking on the **Edit Fields** button.
From here the user is able to:

- Select a field and determine what kind of a delimiter following the field (includes: none, space, tab, comma, newline, custom).
- Change the position of the fields with the up and down arrows.
- Remove or display a field by selecting the Print Field check.
- Print the title for the field (i.e. the title "Date:" would be printed in front of the date field).

After editing the fields select the Done button.

Print preview

To see a print preview, select the **Print Preview** button.



Print an image from DICOM Printer

When the user has finished dragging and dropping the desired images onto the preview window and manipulating size, position and window/level (if necessary), then press the **Print** button in the bottom left hand corner of the *DICOM Printer* dialog. Please ensure all the printer settings are correct first.

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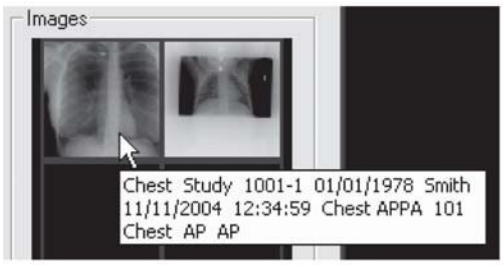
Patient Demographics for Icons

When the cursor is over the icon bank, Advanced DICOM Print will display the demographics for the image.



Multiple Icon Pages

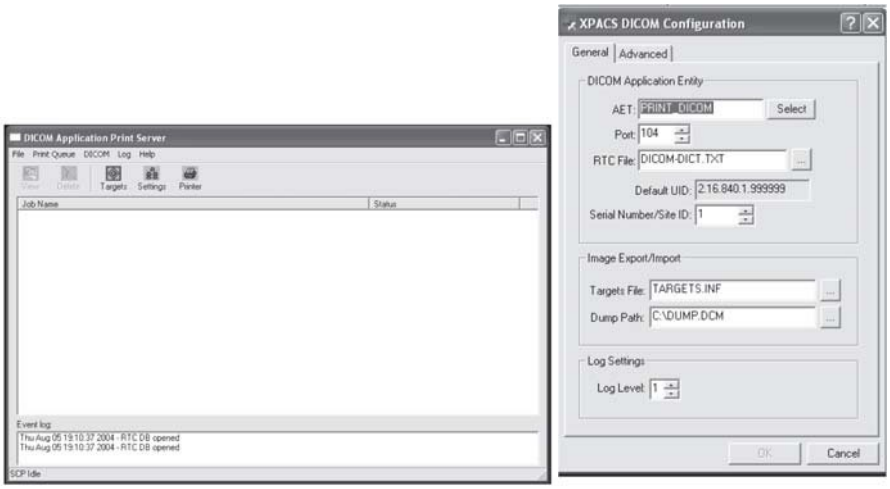
Advanced DICOM Print has an unlimited number of icons that can be loaded. However, the PC's memory is a restriction.

To clear the current page of icons, click on **Clear Current Page** button. To clear all the pages of icons and preview window, click on **Clear All Pages** button.

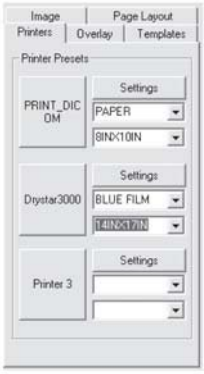
To move between pages and move to first and last pages click on the arrow buttons.

6.22 Printing to a Windows Printer

1. To configure XSCAN to open the DICOM Application Print Server, go to *Options→Preferences→Image Transfer* tab. Select the option *Use Windows to DICOM Printer*. *DICOM Print* must also be selected.



2. The Dicom Application Print Server will print to the default windows printer. In the *Windows Control Panel* select "Set As Default Printer" to the desired printer. The print server uses this default printer.
3. To change the AET, port number or any other information for the DICOM Application Print Server, click on the **Settings** button.
4. To print to the DICOM Application Print Server, set the AET in the Advanced DICOM Printer to the DICOM Application Print Server's AET details.
5. Select the images in QPC XSCAN32 to print and then select the DICOM Print button. Optimize the images in the QPC XSCAN32 software and select print.



6.22.1 Troubleshooting Windows to DICOM Print

1. Make sure there is only one instance of them open in Task Manager. To open Task Manager (Click on Start Menu, Click Run, Type in "taskmgr" Click OK). Close QPC XSCAN32. Look for DCM.exe, DICOMMultiPrinter.exe, AppPrintSCP.exe. If any of these are open please select and click on End Process. Reopen QPC XSCAN32.

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2. Check target information for both applications (Advanced DICOM Print and DICOM Application Printer Server). Select Advanced DICOM Print and click on Configure DICOM button. The DICOM Configuration dialog will appear. The target details for this application are usually: AET: ADV_PRINT DICOM, PORT: 4008, IP: 127.0.0.1, Click on Select to see full details of this target. If Advanced DICOM Print has not been entered as an item in the targets list then please add it with the above details. Then select this new target and click OK. Click OK on the DICOM Configuration to save settings. Close QPC XSCAN32 and reopen Select DICOM Application Printer Server and click on Settings button. The DICOM Configuration dialog will appear. The target details for this application are usually: AET: PRINT DICOM, PORT: 3008, IP: 127.0.0.1, Click on Select to see full details of this target. If DICOM Application Printer Server has not been entered as an item in the targets list then please add it with the above details. Then select this new target and click OK. Close QPC XSCAN32 and reopen. Go to Advanced DICOM Print and Test Printer, assuming that you have the DICOM_PRINT target selected as the default printer to print to. To set it as the default, select the Printer tab in ADVANCED DICOM PRINT and select DICOM_PRINT button. Try printing. If fails recheck that multiple instances are not open in task manager.
3. Make sure no options are selected that should not be selected. If the printer does not support border properties then deselect. If the printer does not support background properties then deselect. If the printer does not support 12-bit images then deselect. Try printing. If fails recheck that multiple instances are not open in task manager.
4. Make sure correct print options are selected. If printing to a windows printer you cannot have BLUE_FILM selected (unless it has BLUE_FILM). You need to select PAPER. The default for a regular windows printer for paper size is 8Inx12IN. Try other options if this fails. If you have the wrong paper size selected it will bring up a failed message in DICOM Application Printer Server and the message log will say incorrect paper size.

6.23 QPC XSCAN32 Keyboard Shortcuts

Function Keys

F1	Rotates an image clockwise.
F2	Rotates an image counter-clockwise.
F3	Horizontally flips an image.
F4	Vertically flips an image.
F5	Inverts an image.
F7	Opens and closes the Window/Level dialog.
F8	Opens and closes the CR Processing dialog.
F9	Resets the window/level of an image to the original window/level setting.
Shift + F8	Opens and closes the Annotations dialog.

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Ctrl + F8	Turns the patient information overlay on and off.
F11	Opens QPC XScan32 Help.
F12	Selects and deselects all image icons.
Ctrl + A	Selects and deselects all image icons.
Ctrl + D	Deletes the selected image icons.
Shift + P	Opens preferences.
Shift + S	Adds images to the send queue.
Ctrl + S	Sends queued images.
Shift + Q	Adds images to the send queue and sends the queued images.
Shift + R	Imports received images immediately.
Right Arrow	Moves to the next image.
Left Arrow	Moves to the previous image.
Down Arrow	Moves to the next row of images.
Up Arrow	Moves to the previous row of images.
Page Down	Moves to the next page.
Page Up	Moves to the previous page.

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